THE
ELECTRICAL REVIEW

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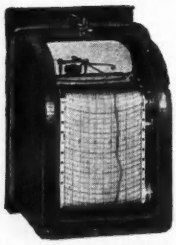

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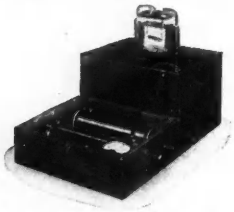

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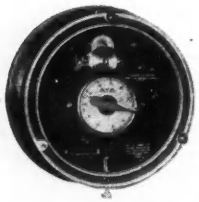

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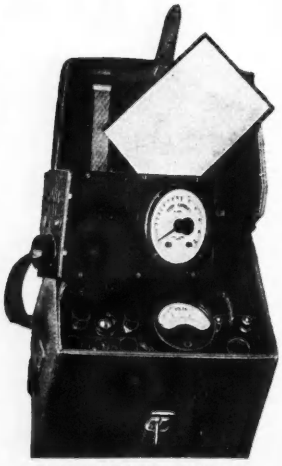

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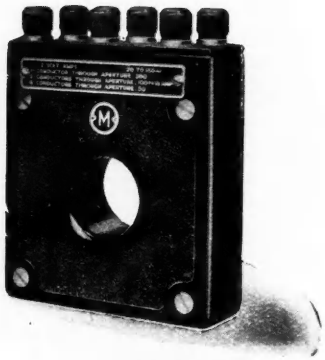

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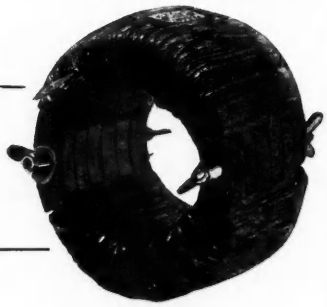

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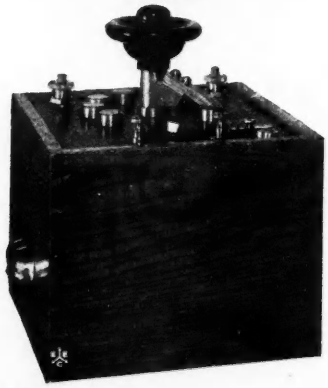

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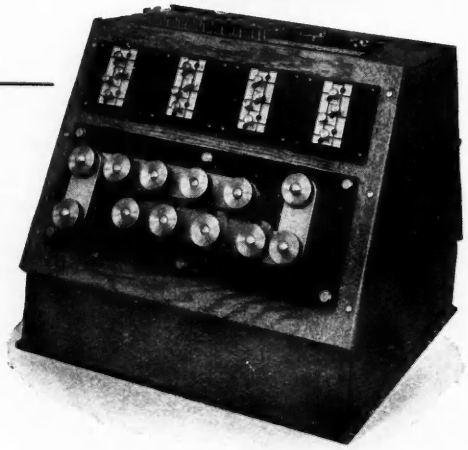

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Industrial Layout

Electrical Installations and Productive Efficiency

WITH rapid extensions to factories engaged in war work and consequent increase in their power demands comes the special need to ensure that the electrical installations are laid out on sound engineering lines, the more so just now since the relationship between productive efficiency and electrical adequacy is beyond argument.

While there are many sides to the subject, such as those dealt with in Mr. G. H. Buckle's lecture to the A.S.E.E. earlier in the year, the problem can be simplified by considering a fundamental principle that settles a number of points.

The principle in question is that the maximum current which switchgear can be economically constructed to break on short-circuit is fixed at 44,000 A. This figure, for various sound reasons, has been adopted in B.S.S. No. 116 for oil circuit-breakers built for 3.3 kV and above, and there is good reason to suppose that it will not be exceeded in the Specification for lower-voltage gear which is now in hand.

Effects at Lower Voltage

Although more attention has been paid to the rupturing of high-voltage currents, in some ways conditions of service in this field are less onerous than those found at 400 V, with which the works electrical engineer is generally more closely concerned. In the first place, a fault current of the magnitude mentioned is improbable at the higher voltages, whereas at 400 V it is equivalent to only 30 MVA, and as the thermal effects and electromagnetic forces are proportional to the square of the current, the stresses imposed are very much higher in the latter case. Furthermore, the liberation of energy at medium voltage is greater in relation to MVA capacity for the same current, for reasons given by Mr. C. J. O. Garrard in our columns last year.

Most damage can be done while switching in on a fault, when the peak values of the current may be 2.55 times the breaking current, and if heavy-current breakers are employed adequate immediate contact is obtainable only by incurring expenditure on mechanical closing devices. It is important to bear in mind, too, that 400-V switches may be out in the works, where protection from personal injury due to their possible failure is less complete than in the case of high-voltage gear and where they would perhaps be operated by less skilled men.

Taking the upper limit of rupturing capacity for 400-V breakers at 30 MVA and assuming that the convenient method of rating breaking capacities in 25-kVA stages adopted in B.S.S. 116 is retained in the medium-voltage Specification, it would appear that the output of associated transformers with ordinary values of inherent reactance should not exceed 1,500 kVA. Actually some latitude can be taken, as the effect of reactance on the high-voltage side of the transformer and of impedance of low-voltage connections may be to permit of 2,000 kVA of transformer capacity for each bus-bar section. For a more detailed survey of these aspects the reader is referred to articles by R. T. Lythall that have appeared in this journal during the past three years. The duty of the breaker may be further appreciably reduced if the resistance-reactance ratio of the circuit is high, as Mr. Garrard has shown.

With a view to making provision for essential stand-by and for adequate maintenance of switchgear which otherwise presents difficulties with long running hours, the transformer capacity should be divided into at least two units. This would have the additional advantage of keeping the load-current rating of the switch within the proposed standard of 1,600 A.

Checking Existing Installations

In regard to older installations it will be necessary to check the capabilities of circuit-breakers that were installed perhaps before rupturing capacity became of major importance or before ratings could be as accurately assigned as they are to-day. In such cases the manufacturers should always be consulted. Unfortunately there is not the same scope in factories for using switchgear rated at less than the kVA now obtainable as there is on public systems, where it can be removed to places more remote from the source of supply, although possibly its use with smaller transformers may be feasible.

It will be apparent from the foregoing that thoughtful planning, based on the limits imposed by switchgear manufacturing conditions, will ensure that an installation possesses essential requisites of a good scheme that is in accordance with standards approved by experience. These are restriction of fault currents, flexibility for meeting further developments as a permanent asset, sectioning with a view to

reducing the amount of plant out of commission through breakdown, provision of facilities for maintenance of equipment and increasing the safety of operatives.

Limitation of Supplies

SINCE the Limitation of Supplies Order was issued there has been a great deal of uncertainty as to the position of electrical appliances. A short time ago it was decided that industrial lighting fittings were not subject to limitation, and now, thanks to the assiduous attention given to the matter by the Electrical Wholesalers' Federation, the situation with regard to a wide range of domestic apparatus has been cleared up. In this issue (p. 181) we give lists supplied by the E.W.F. of goods which are controlled and those which are exempt. Some of the decisions are surprising. For instance, while hair clippers are limited, hair-curling appliances are not. Moreover, the list of exemptions includes several articles which might legitimately be considered "luxury" items. It gives us satisfaction to see that electric cooking, heating and water-heating apparatus generally is excluded from the scope of the Order, although that satisfaction is tempered by the thought that the materials shortage has already imposed far more severe limitation upon production.

Purchase Tax on Fittings

FAIR trading is one of the important electrical subjects which the war has tended to push into the background, but it is most gratifying to find that the valuable spadework put in by those who framed the Fair Trading Policy has found a useful wartime application. As in the case of the Limitation of Supplies Order, the position with regard to lighting fittings under the Purchase Tax provisions of the Finance (No. 2) Bill was by no means clear. Accordingly the Electric Light Fittings Association made contact with the Customs and Excise Department in order to secure definite rulings as to which fittings were and which were not subject to the tax; the results are set out on page 172 of this issue. It will be seen that throughout the negotiations the lighting fittings schedules of the Fair Trading Policy were used as a basis, and as this classification was very thoroughly worked out by the authors of the Policy the outcome should be satisfactory.

Unloading Asphalt

WARMING unloading pipes from tank wagons electrically obviates the risk of moisture entering the stills, as may happen when low-temperature steam jackets are used. As the stills are operated at about 500 deg. F., any moisture present flashes into steam, causing the contents to bubble over, clogging the exhaust condensers and even allowing asphalt to be thrown out of the vent stacks. Considerable monetary savings are obtainable through decreasing the time taken, and the *General Electric Review* cites an instance at Ohio in which unloading costs were reduced by 80 per cent. to 75 cents per tank wagon and output tripled through the adoption of electric heating. In this installation thermostatically controlled heating units connected in series-parallel were wound in 2ft. 6in. spirals round 600ft. of 2½in. pipe, maintaining a uniform free-flowing temperature of 400 deg. F., hot spots being eliminated with the aid of a sheet-metal covering.

Decontamination

WHILE gases have not yet figured among the destructive agents adopted by the enemy, it is quite unwarrantable to assume that they would not be exploited to the full in any conditions favourable to their use. Much less information is available regarding the effects of liquid persistent gas on electrical plant than on human safety, although the latter is indirectly involved, and the Electricity Commissioners have commendably drawn attention to a report of a committee convened by the North-Eastern Electric Supply Co. (see page 171 of this issue). Metals present little difficulty as they can be cleaned with solvents, but when insulation (especially types in which the gas is liable to dissolve in the material) has been contaminated the only course open usually is to destroy it. Enamel and rubber compounds are exceptions; bleach paste and solvents will save the first and bleach paste will often prevent the slow embrittlement of the latter if it is applied immediately. The question as to whether plant is totally free from contamination after the application of the recommended treatment should, in any case, be decided by an expert in war gases.

A Great Victorian

APART from the value of his contributions to science, which are referred to elsewhere in this issue, Sir Oliver Lodge deserves to be remembered for his influence in encouraging the development of a scientific outlook among all intelligent people. This aspect of his nature was aptly illustrated in the interest he took in the work of the British Association for the Advancement of Science. Yet, important as were his achievements, it is doubtful whether they fully expressed his capabilities. It may be, as he was inclined to believe, that with a different training he would have accomplished more as a mathematical than he did as an experimental physicist, but there was probably a deeper reason. He had, as he himself recognised, a temperamental aversion from carrying things through to the end, even though the effort needed to round off his discoveries might be small compared with that put forth by him in the investigation stage. But for this defect of what is essentially an engineering quality, his claims to recognition in many directions would certainly have been more firmly established. The interest he took in psychical research was altogether secondary to his enthusiasm for physics, and he held that one should exhaust the possibilities of the known before referring to the unknown. To him death itself appeared but as an opportunity for further exploration.

More Light

IN spite of all the restrictions which have had to be placed on lighting it is true to say that there need be no diminution whatever in the sum total. What has been lost in the streets should easily be made up in the factory, the office and the home. It was generally accepted before the war that the standards of lighting in this country (and other countries for that matter) were far below what might reasonably have been expected in the twentieth century. The fallow fields which the lighting industry sought to cultivate in peacetime still remain largely untilled and war conditions accentuate the need for continued effort. In this issue we show that the lamp manufacturers are again actively preparing for the winter and we urge everybody in the electrical industry to lend their support to this worthy cause. Next week we intend to deal with lighting in a broader way and articles by experts in their particular branches will cover the principal aspects of the subject.

Electricity and Aluminium

THE undertaking of the Dominion of Canada to provide the United Kingdom with about 90,000 tons of aluminium during 1940 again draws attention to an important contribution of electricity to the war effort. Only where there is a cheap and abundant supply of electricity can the metal be produced on anything like economic terms. The production of ingot aluminum is in the hands of the Aluminium Company of Canada, which has a subsidiary owning the 540,000-HP Isle Maligne hydro-electric plant and an associated company with a plant capacity of 260,000 HP at Chute-a-Caron. Plans were drawn up a year or two ago for the development of 1,000,000 HP in the Shipshaw area. So it will be seen that so long as a sufficient supply of bauxite is forthcoming (mainly from British Guiana) there will be no shortage of power to deal with it.

PRINTING WORKS DRIVE

Meeting Variable Speed Requirements

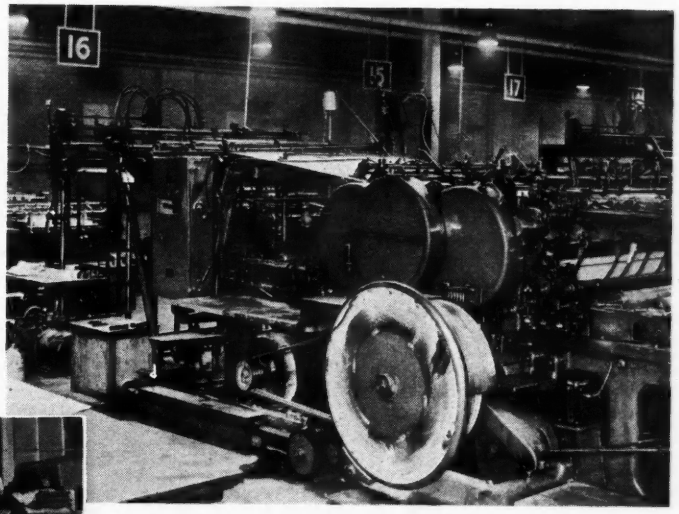
ONE of the industries in which direct current is still largely favoured on account of the variable speed applications is printing, and when James Cond, Ltd., were faced with a compulsory change of premises in Birmingham as the result of town planning, they found that a change of public supply from DC to AC also confronted them. Their existing electrical equipment was in every way satisfactory, representing considerable capital. It provided the infinitely variable speed regulation required on the majority of machinery for high-class letterpress work, such as multi-colour catalogues, art reproductions, display posters and technical books. The company's consulting engineer, Mr. R. P. Hulse, B.Sc., considered alternative means such as AC commutator motors and normal AC motors with variable speed gears, but it was decided that as the cost of DC motors and high quality starters represented only from 5 to 10 per cent. of the cost of the driven machinery, the main object should be to operate the machine with a view to obtaining the highest quality consistent with maximum production which, they considered, could best be obtained by continuing work with DC motors.

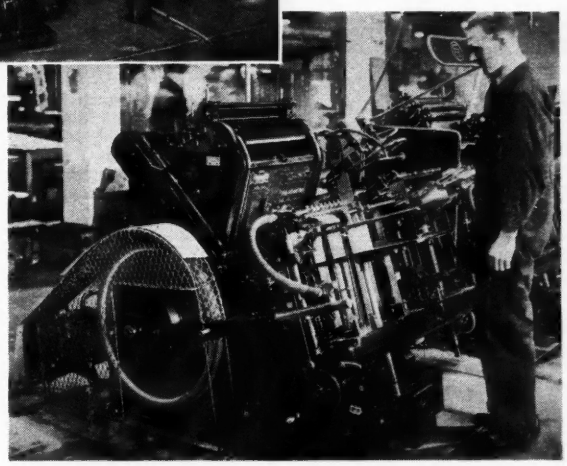
Further consideration of the tariff for AC high-voltage supply indicated that AC for power purposes would cost 15 per cent. less than the price paid for DC, and that as the efficiency of a rectifier is not less than 90 per cent. at normal operating loads, the cost per kWh of rectified DC would be about 5 per cent. less than that paid for DC supply in the old works. Further, the high power factor of a rectifier would enable a rebate to be obtained, giving a total reduction of probably 10 per cent. in the cost of DC supply for power purposes. Because the efficiency of a two-wire rectifier is at least 3 per cent. higher than that of a three-wire unit of the same output, it was decided to use only 440-V motors in the new works.

There was no inducement to adopt DC for lighting as the transformer used for the rectifier could have a separate winding to give a 400-V, 3-phase, four-wire supply.

Six-phase rectification was adopted, primarily as a means of eliminating ripple, but also because two three-phase bulbs assure a 50 per cent. supply continuity in case of a single bulb failure. The two outputs demanded a specially designed transformer, of course, and failure could only be safeguarded against by purchasing a spare, but as duplication of the original layout was envisaged, this only meant purchasing the spare transformer a year or two in advance of the works programme. Uniform voltage is essential for accuracy of registration in multi-colour work, and the fundamental difference in this respect between fork and interconnected star transformer windings for six-phase rectification, and the possibility of only one or two machines operating during overtime with the load at or near the critical point with the star-star connection was a very strong point in favour of the fork connection scheme.

The decision to earth the negative and adopt 440-V to earth suggested the possibility of trouble on small motors, but experience has since shown that any liability due to the higher pressure to earth is not appreciable, even on small motors. The starters may require slight additional protection, but rewirable fuses of the standard type require special consideration. In summarising the results from the managerial point of view, Mr. James Cond said that the power costs had been reduced by about 10 per cent. in the new factory, and that, while lighting had been nearly doubled as regarded illumination values, its cost had been reduced.





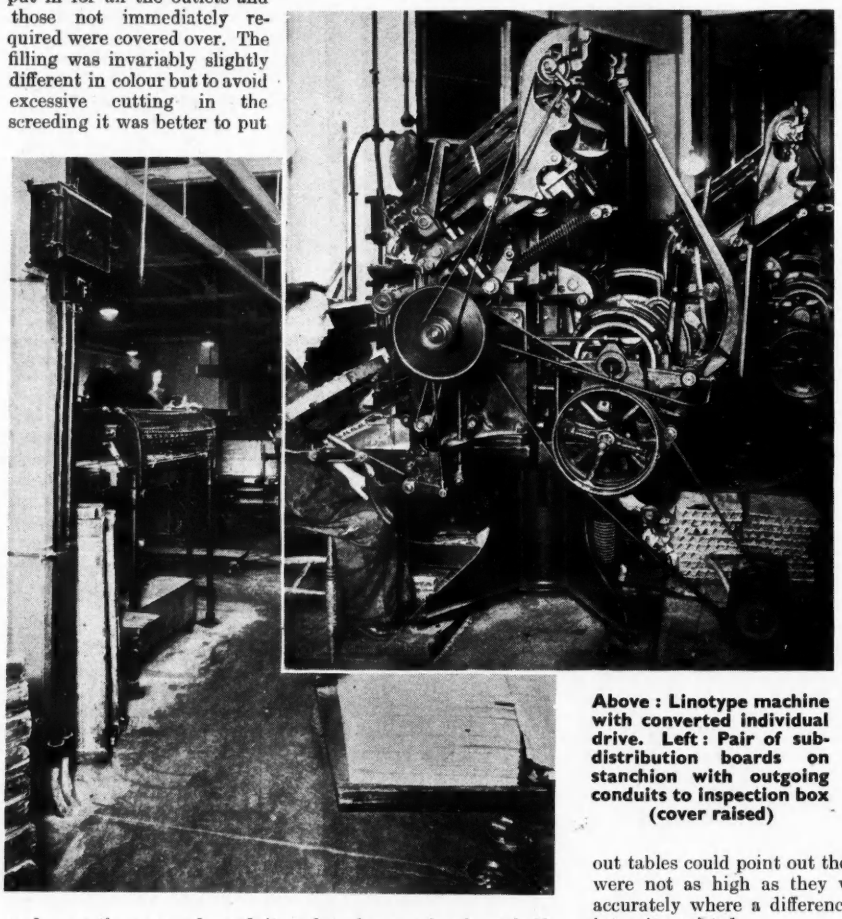
Above: Drive of a two-colour Miehle machine showing automatic feed. Left: Individual drives on a Cundall automatic folder. Below: Platen machine showing drive and controls

For the control of the 11,000-V supply from the Birmingham undertaking, and the housing of the high-voltage and low-voltage switchgear, a substation has been provided in the works, and in this there is one 140-kVA transformer fitted with secondary windings to give an 80-kW rectified current supply, and a 60-kVA, three-phase, 50-cycle, 400-V supply. The high-voltage switch panel for the control of this transformer forms an extension of the supply undertaking's ring-main switchboard, and although of different make, in dimensions and general appearance it is identical with the main part of the board. The rectifier is of the mercury-arc glass bulb type, with two bulbs, each arranged for three-phase rectification for 440-V DC and working in parallel. The DC main control circuit-breaker is mounted on the cubicle containing the rectifier bulbs, and outgoing feeders are controlled by an ironclad switch and fuse board. The distribution is controlled by a similar board, and in all cases high-rupturing capacity cartridge fuses are used. The minimum size of fuse is 60-A, and provided the size of fuse wire is carefully controlled on the sub-fuse boards handling the motor circuits, good discrimination is obtained

both with regard to the main circuit-breaker and in the individual motor fuses.

The works is mainly a single-storey building, and the whole of the printing machines are situated on the ground floor where, to avoid conduit obstructions to the natural lighting, the new floor conduit system of the Walsall Conduit Co., Ltd., was installed. This appeared to provide great flexibility with regard to positions for services to the machines to necessitate the least possible floor breakage and to permit wide alterations for future extensions, &c., at little expense. Conduits carry mains across the building, which is about 100 ft. wide and 200 ft. long, feeding fuse boards fixed on the roof stanchions, and large outgoing conduits passing downwards into inspection or drawing-in boxes, from which single rectangular conduits run from end to end of the building in the concrete floor.

As the lines of machines were definitely determined, the floor ducts were carried near the driven ends of the machines, and by providing plugged screwed outlet points at suitable intervals, the outgoing conduit connections to motor control gear were, and can be, added as desired. Where possible, such outlet conduits were arranged before the final floor screeding was put down, but plant alterations have shown that in any case the worst result is chopping out three or four feet of conduit in the floor and fixing the conduit box to the screw outlet point provided. There is no necessity to leave any mark or indication where these points are available, as in the first case when the floor was laid wood plugs were put in for all the outlets and those not immediately required were covered over. The filling was invariably slightly different in colour but to avoid excessive cutting in the screeding it was better to put sand over the screwed conduit and to have only about half an inch of screeding to finish off the hole. Where conduit outlets are arranged, great care must be taken with the screwed outlet connections, using lead washers and lock nuts in preference to red lead to prevent any liquid entering by the side of the conduit. As a result of a flood in the works, the staff now know, however, that drying out of the cables can easily be accomplished by opening up the main inspection cover and connecting the works vacuum cleaner on to a remote service outlet point to create an air flow through the system. An insulation resistance of over 10 megohms for cables serving fifty motors is maintained with this help. To facilitate the installation of cables for future plant extensions, a permanent drawing-in wire has been left in the system, extending from each end to the central inspection box. Both the AC and DC distribution systems have been accommodated in this conduit installation, and suitable high-grade cable has been employed because of the potential difference between certain conductors which is of 400 V to earth for the rectified supply plus 230 V AC, or a maximum of about 760 V.



Above : Linotype machine with converted individual drive. Left : Pair of sub-distribution boards on stanchion with outgoing conduits to inspection box (cover raised)

The lighting cables are run in conduits at roof level, and as the lighting fittings were not installed until the positions of the machines had been definitely fixed, there was not the usual difficulty in obtaining a suitable arrangement of lighting points to give good general lighting, with local lighting of higher intensity where special work is done. Holophane fittings are used generally, and it was found that with a height to spacing ratio of practically one to two, it is still possible to obtain a higher lighting intensity halfway between two lighting points than occurs directly under each fitting. It was not thought necessary to provide the levels recommended by E.L.M.A. throughout, although close approach to them was made at points where the more specialised work is carried out.

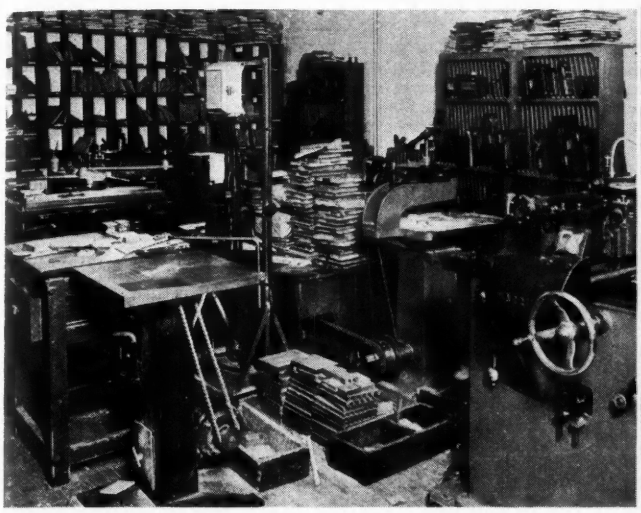
A problem presented in the typesetting department owing to point reflections from the new type was solved by a fitting in which the intrinsic brilliancy of the illuminated surface is less than that resulting from the other fittings referred to. Benjamin "Glassteel" fittings are used, as in addition to their large wide enamelled reflectors, they also have a fairly large opal bulb tending to give a softer and more diffused effect on the bright surfaces. The positions of the fittings closely approximate individual lighting points at a mounting height suitable for general lighting, and the result is a lighting intensity of 20 to 25 ft.-candles.

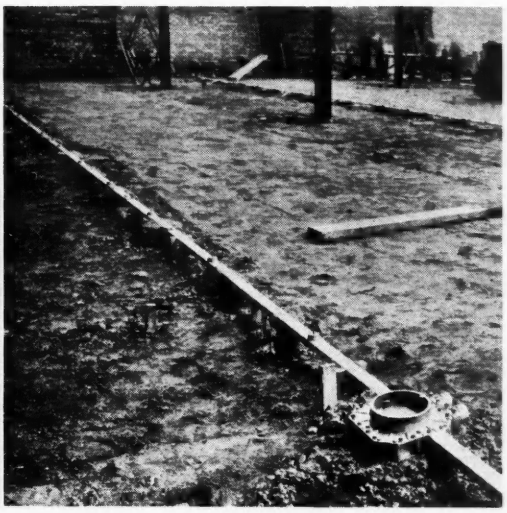
In the typesetting department, a number of machines which were group driven in the old works have been fitted with individual drives, and this has permitted a much better arrangement for lighting and accessibility. Other machines dealing with type of this sort are the monotype casting machines, and here again individual driving is now adopted, while the thermostatically controlled electrically heated type melting pots are supplied from a separate distribution cable as special furnace supply tariffs are applicable. Again, in the stereo department there are individual drives for such equipments as planers, routers and metal saws, and in such sections as this, where a considerable number of small motors are required, it was found to be more economical to put in a local sub-fuseboard which, in this particular instance, is mounted centrally on an angle-iron frame with the motor starters, thus affording an excellent and neat local central control system. The different forms of type from these three sections, together with the blocks, now pass on to the laying-out tables, where the complete formes are assembled before they are sent down to the letterpress machines. It was curious to discover that the operatives on the setting-out tables could point out the exact spots where lighting values were not as high as they wished, and actually discriminate accurately where a difference of only 20 per cent. in lighting intensity existed.

Most of the large work is done on Miehle letterpress machines on which individual driving with exact speed control over a large range is absolutely necessary. Racing has been experienced with these machines, even though a stability series winding is incorporated in each of the motors. This is the result of the very peaky nature of the lead; it is necessary not only to drive the forme backwards and forwards at a high speed but also to accelerate the inking rollers at each end of the forward stroke. Peaks are more likely to be due to the inking rollers than to the reversal of the bed, and it is not desirable to put an excessive amount of compounding on the motors. Further, with normal stability series turns, it is essential to maintain the correct position for brushes after any overhauls, as the additional demagnetisation due to incorrect brush positions may cause serious trouble when the maximum load is required at the high speed.

Fluctuating speed or irregular variation would have a bad effect on exact registration for high-class multi-colour printing, and the slightest tendency to variation is picked up at once by the machine minder and has to be rectified. It is a little surprising to learn that a more liberally arranged equipment with heavy cables has a greater liability to trouble of this sort, owing to the small damping due to the low C^2R drop in the lines than is the case in an installation where the cable size is reduced very considerably.

After two or three passes through the Miehle machines, the sheets have to be cut to exact size on motor-driven guillotines and then folded, which operation also calls for high speeds with great accuracy. Letterpress machines and folding equipments are both fitted with certain types of automatic feeders for which additional separate motors are required, and constant speed machines are suitable for this work. From the folding machines the partially completed sections have to be stapled together, and a particularly interesting equipment for this purpose incorporates an endless-chain conveyor on which girls place at short intervals the respective sheets, each as an inverted V over the sheet from the preceding operative. The machine itself gauges the exact thickness of the full set of of sheets. If this thickness is too great or too small, an electrical contact fails and the staple with which the sections are bound together is not fed into the machine. A similar device of some sort is arranged on all automatic machines, so that if any sheet is not fed correctly or fouls any of the mechanism, and gets torn, the whole machine is immediately brought to rest, thus avoiding passing defective work and further damage.





Left: The fuseboards and starters on the frame amid this cluster of stereo department machinery afford an excellent local control scheme. Right: Assembly of floor ducting system

We are indebted to Messrs. James Cond, Ltd., for permission to visit the works and to Mr. James Cond and Mr. Hulse for their help in the preparation of this article.

NEW BOOKS

Vibration in Machinery—An Introduction to General Principles. By W. A. Tuplin. Pp. 111; figs. 26. Sir Isaac Pitman & Sons, Ltd., 39, Parker Street, W.C.2. Price 7s. 6d.

The tendency in modern machinery is towards the adoption of higher speeds and lighter construction, with the result that vibration becomes a serious consideration and demands that due provision be made to eliminate its destructive influences. Should the operating speed of some part of a machine be within range of its critical speed there may arise a serious problem for the designer or for the engineer who arranges the coupling up of, say, an electric motor and a machine to be operated in combination. Although the basic considerations in connection with vibration in machinery are quite simple and can be related to common experience, the subject is one which for its full presentation requires mathematical treatment of an unfamiliar kind so that the ample literature on the subject appears distinctly formidable to the average reader.

It is therefore very satisfactory to find in this little volume that Dr. Tuplin has in easy and practical terms given a general review of the fundamental principles with as little in the way of mathematical treatment as seems possible, while at the same time providing simple formulæ for guidance in design and an introduction to the more highly technical treatises on vibration theory. The opening chapter places the reader in possession of the general principles on which the study is based and illustrates these and the damping influences which are available by readily acceptable examples.

He then proceeds to explain the determination of the natural frequencies of multi-mass systems and how they differ with the different modes of vibration which may be set up in any such system. This, of course, leads to the influences which excite vibration and to the methods of harmonic analysis applicable to the usual machine vibrations. Perhaps to the electrical engineer the more elusive subject of torsional vibration is of especial interest though it is even more vital to the internal combustion engine designer. The chapter dealing with this important aspect is one which will repay study as it sets out the methods of calculation of amplitudes and stresses produced at critical speeds and explains the general method of determining natural frequencies.

The later part of the book deals with the reduction of vibration stresses by absorbers and the use of flexibility to diminish vibration by spring, by rubber and by cork as absorbing materials. It includes a chapter on the measurement of vibration and gives several typical examples of machinery failures due to vibration. The formulæ relating to typical machine and structural details are conveniently gathered together in the appendix, while the bibliography of references will also be found an extremely useful guide and assistance to further study.—J. A. C.

Electrical Measurements and Measuring Instruments. By E. W. Golding. Third edition. Pp. 828; figs. 447. Sir Isaac Pitman & Sons, Ltd. Price 21s.

There have been many minor but important developments in the art of electrical measurement since the appearance of the last edition of Mr. Golding's well-known treatise in 1935, and this new edition, which has been brought up to date, will be welcomed by students, testing experts and by research workers.

The principal additions to the last edition comprise an account of the Giorgi (M.K.S.) system of electrical and magnetic units, a description of some new methods of magnetic testing, some small but welcome amplification of the sections on AC potentiometers and instrument transformer testing, and an explanation of the modifications of meter testing technique necessitated by the passing into law of the Meters Act of 1936.

The book is laid out to cover the requirements of the syllabus of the B.Sc. (Engineering) examination of London University in this subject. It deals exhaustively with the underlying principles of electrical measurements, and with the theory and technique of both laboratory and commercial measurement in the fields of resistance, inductance and capacitance, and of magnetic and electrical quantities. Other important matters adequately treated are illumination, the localisation of cable faults, electrical methods of measuring temperature, and the harmonic analysis of non-sinusoidal wave-forms. An important chapter on high-voltage testing adds greatly to the practical value of the book.

A very full bibliography is appended to each chapter, and the book concludes with a collection of over 150 problems, with answers, included in which are questions from recent examination papers. The reputation of Mr. Golding's book stands so high that our commendation is hardly necessary. It will be invaluable to the student, and it should be found a home in the library of every laboratory and test house.—G. W. S.

CONDITIONS OF EMPLOYMENT

Joint Industrial Council Decisions Enforceable

By A. H. Banks*

QUIETLY and unheralded a very important change has been brought about in industrial relations between employers and workers by Statutory Rule and Order No. 1305, July 18th, 1940 (Conditions of Employment and National Arbitration), which was dealt with in the ELECTRICAL REVIEW of August 2nd, p. 88. Joint Industrial Councils have on many occasions discussed the desirability or otherwise of making their decisions enforceable by law. Some Councils have pressed for legal enforceability, but others, chiefly those dealing with the public utility services, have preferred to use persuasive means and rely upon the voluntary system. Bills have been introduced in the House from time to time to create a legal obligation on all employers to honour Joint Industrial Council decisions, but they have all been dropped. Now by reason of the new Order the long-debated power to enforce such decisions has been established almost "overnight."

Part 1 of the Order establishes a "National Arbitration Tribunal" primarily to deal with cases for which no recognised Joint Industrial Council operates; although in certain circumstances this tribunal might be called upon to function even where there is a Joint Industrial Council.

The Order provides that if any trade dispute exists, it may be reported to the Minister of Labour and National Service "by or on behalf of either party to the dispute," and thereupon the Minister shall refer it for settlement in accordance with "the provisions of any agreement to which the parties are organisations representative of employers and workers respectively." If there is a failure to reach a settlement by this means, or a settlement is unduly delayed, then the Minister may refer the dispute to the National Arbitration Tribunal. This provision is important, because it is not an unusual feature for disputes to reach a stage of opposite voting on both sides, and frequently the matter is left in that unsettled stage because neither side desires to press it further.

The reader will notice that the failure to settle is not necessarily by the Joint Industrial Council, but must be a failure to settle by virtue of "the provisions of any agreement to which the parties are organisations representative of employers and workers respectively." If, therefore, provision for arbitration is contained in the Joint Industrial Council's agreements it seems clear that there could be no failure to settle a difference unless the arbitrator failed to make an award.

Enforced Arbitration

Where there is no provision for arbitration the circumstances will be different, and a failure to agree in the Council would result in a failure to settle the dispute within "the provisions of any agreement to which the parties are organisations representative of employers and workers respectively." It must be realised, therefore, that in these cases the provisions of the agreement would be exhausted if the Council failed to agree. Consequently, the Minister would then be in order in referring the difference to the Tribunal. The effect of the Order, therefore, is to enforce arbitration by the Tribunal where a Joint Industrial Council fails to agree, or delays coming to an agreement, and the only method of avoiding such a possibility (if so desired) would be for the Council to insert a provision in its agreements providing for arbitration by some other tribunal, for instance, the Industrial Court.

Where a Joint Industrial Council does not exist, the Minister must take "any steps" which seem to him expedient to promote a settlement of a dispute, and he may refer it to the National Arbitration Tribunal. Where a dispute has been referred to a Joint Industrial Council and a prompt settlement does not result therefrom, the Minister must refer the dispute to the Tribunal. It is clear from these provisions that wherever a Joint Industrial Council exists for an industry, that Council must be the body to which a dispute is first referred, and it must deal with it expeditiously; otherwise, its jurisdiction will be ousted by the Minister in favour of the National Arbitration Tribunal.

Any agreement, decision or award made under the above-mentioned provisions will be binding upon the employers and workers concerned, and may be retrospective to the origin of the dispute.

Promptness in settlement by a Joint Industrial Council may introduce a real difficulty in the present times, because such a Council in general moves slowly in order to move quickly. This may sound like a contradiction, but in practice it is not so. Frequently a difference which appears to be of a minor character raises questions of principle in which a settlement for a small number of men or for one town or district would inevitably react throughout the industry. By the consent of both sides such matters are sometimes deliberately delayed until a settlement of wider application is made, and it is certain that the most delayed decision of a Joint Industrial Council achieves its object for the whole industry in a fraction of the time that would otherwise be employed in individual negotiations. It might be difficult in practice on some occasions to reconcile this long-term policy with the speedy settlement of disputes referred by the Minister, and it may be that Joint Industrial Councils will have many disputes referred to them and find it necessary to delegate their powers to Committees in order to satisfy the Minister's demand for (and measure of) promptness. Twenty-one days from the date of the reporting of the dispute is the time allowed, unless the Minister considers it necessary or desirable to extend it.

The general wording of the Order contemplates that disputes shall be handled by organisations of employers and workers. There is, however, a phrase which is peculiar, *i.e.*, the words in Section 2 (1) which enable a trade dispute to be reported to the Minister "by or on behalf of either party to the dispute." The original parties to a dispute are generally the actual employer and worker, and therefore from these words it would appear that either of those parties or the organisation to which either of them belongs would be entitled to make the reference. In fact, the words "by or on behalf of" would admit of no other meaning, but it would be a novel situation for a man who was not a trade unionist to report a dispute with a non-member employer and thus invoke the aid of the Joint Industrial Council for the industry. There is, however, no escape from this possibility.

A trade dispute is defined as follows:—

> "A trade dispute means any dispute or difference between employers and workmen, or between workmen and workmen connected with the employment or non-employment, or the terms of the employment or with the conditions of labour of any person."

This definition is as wide as could reasonably be conceived and provides a fertile field which may be anticipated to keep Joint Industrial Councils busy.

Part II of the Order prevents strikes or lock-outs, but I refrain from comment on this part, even if any were necessary, because strikes and lock-outs are, to the great credit of all concerned, something quite foreign to industries which have been governed by Joint Industrial Councils for the past twenty years or more.

Part III creates an obligation upon all employers in an industry to observe the recognised terms and conditions established by Joint Industrial Councils for the industry, and if any question arises as to the "nature, scope or effect of the recognised terms and conditions in any trade or industry in any district or as to whether an employer is observing the recognised terms and conditions," then the question may be reported to the Minister by any organisation of employers or any union concerned, and thereupon the question shall be dealt with by the Minister in exactly the same manner as a trade dispute; that is to say, by the Joint Industrial Council for the industry or by the National Arbitration Tribunal if there is no such Council, or if the Council unduly delays the making of a settlement. The decision of the Joint Industrial Council is binding upon the parties as in the case of a trade dispute. This part of the Order is very far-reaching, and it is quite clear that either the employers' or workers' organisations, *but not the individual parties*, are free to report defaulters to the Minister and initiate proceedings.

Position of Non-members

Some difficult questions may also arise under this part of the Order. For instance, suppose an industry's agreements contain zoning or grading schemes under which differential rates are paid in different towns, and one of such towns has never been a member of the Council. In such a case, what are the terms and conditions in that district? In truth, they have never been agreed, and it remains a moot point whether there can be said to be any such terms and conditions. Different circumstances would arise in the case of national agreements, or under district agreements which made provision for rates in a particular town which had subsequently ceased to be a member of the Council. In the former case—unzoned or ungraded towns—the most appropriate procedure would be to have the matter dealt with as a trade dispute, because action by way of enforcement of established terms and conditions would almost certainly fail.

From the foregoing it is clear that a new order of things has come into being, in which the Joint Industrial Council (by whatever name it is known) is destined to play a vital part, and it becomes a problem for serious consideration as to whether or not any employers can with propriety remain outside their industrial organisation. It would be unfortunate if employers' organisations were to invoke the aid of the Minister to force non-members to pay standard rates and conditions, and it would be much more satisfactory for all employers to see the wisdom of joining their appropriate organisation, and thus contributing their experience and knowledge

* Employers' Industrial Adviser, Electricity Supply Industry.

thereto. After all, one new member joining voluntarily would be worth more than a dozen "conscripts." It must not be forgotten that wages and conditions do not form the sum total of a Joint Industrial Council's activities, and, particularly at the present time, there are many other matters upon which the members can receive useful information and guidance.

Parliament has now realised that responsible employers and trade unions, who have made a close study of the conditions in their own industries, are capable of making decisions which it is safe and desirable to enforce upon all employers. This change will emphasise the responsibility for ensuring that Joint Industrial Council decisions will stand the careful scrutiny of all parties concerned on both sides of industry, and also the consumers of their products, because any collusion between the two sides would inevitably lead to suspicion and withdrawal of members.

Let me explain this more fully: Suppose the employers' side concurred in a decision that a wage should be fixed at 80s. per week when economic conditions in the industry indicated that the wage ought to be 75s. The immediate effect would be that the 80s. would be enforceable against members and non-members, but the employers in the industry could remedy matters by withdrawing from their organisation, thus destroying the Council and removing the foundation of the authority which enforced the 80s. A similar process of disintegration could take place on the initiative of the trade union members if their leaders failed to do the best for their members; an event much less likely to happen.

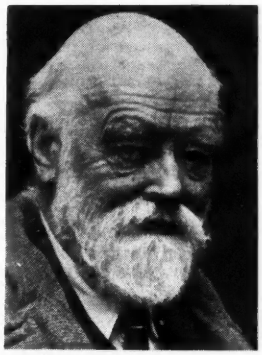
In either of the above events the resulting chaos would be so disastrous to both sides that it is difficult to imagine such a happening, but it will be increasingly important that employers and trade unions in every industry should conduct their business and settle their problems by combining their long experience with a judicial sense.

This article is written by me as an ordinary student of current industrial problems, and does not necessarily reflect the views of any of the members of either side of the various Joint Industrial Councils for which I act as employers' officer. Its purpose is to focus attention on an aspect of industrial relations which is entirely new and extremely important.

Sir Oliver Lodge

A Great Scientific Teacher

BY the death last week of Sir Oliver Lodge at the age of 89 the world has lost one of the few survivors of the great Victorian age of science. His work, as he himself said, reached its climax in the 'nineties—a decade more fruitful of discoveries in physics than any other in history. The last time we heard him speak in public was at the Kelvin Lecture in April, 1932, on which occasion he received the Faraday Medal. His tribute to Dr. Sumpner's account of Heaviside's work showed how keenly he had been following the more abstruse aspects of the subject. A giant he appeared to us, but not only in his bodily proportions—he was six-foot-three in height and broadly built; he seemed to tower intellectually, and the effect of his dominating individuality was enhanced by the rare quality of his voice.



The late Sir Oliver Lodge

Oliver Joseph Lodge was born on June 12th, 1851, at Penkhull, near Stoke-on-Trent. He gave few indications in boyhood that he was destined for scientific eminence. It was reported that he possessed a good memory but no special ability; this was probably due very largely to his unhappiness at school, where he was taught little except classics by rote. After some years at Newport (Salop) Grammar School and a short period at Coombs Rectory in Suffolk, he started a business career at the age of fourteen by assisting his father, a pottery merchant; this proved an uncongenial occupation, involving much routine work, giving him little leisure for other pursuits.

He continued these duties until his twenty-third year, but a visit to London when fifteen had turned his thoughts to science under the inspiration of Tyndall (whose widow also died last week), whom he heard lecture on heat at the Royal Institution. He thereafter studied chemistry in the evenings and experimented with electricity. Self-study enabled him to pass the London Matriculation in 1871, and early in 1874 he began his scientific life as assistant to Professor Carey Foster at University College, London. In 1875 he received his B.Sc. degree and wrote several papers on electrical subjects; in 1877 he took his doctorate with experimental electricity as his special subject, and shortly afterwards married.

Promotion came in 1881, when he was offered the chair of physics at Liverpool University. Lodge had first to lay out and superintend the installation of the laboratory, which for the next nineteen years was to be the scene of a series of brilliant experiments that perhaps only partly manifested the tireless energy of their designer.

His appointment as principal of Birmingham University in 1900 brought freedom from teaching and enabled him to devote his mind entirely to original investigation. In 1902 he received his knighthood. In 1919 Lodge retired from academic life, but not from work; out of thirty-six books written by him, fifteen appeared after 1923.

The Beginnings of Wireless

The name of Lodge will be especially associated with his researches into the relation between matter and the ether of space and with his discoveries and inventions in wireless communication. In 1893 he carried out an elaborate experiment to demonstrate that matter has no power of gripping the ether and that such power is not conferred by electricity or magnetism.

His discovery, in 1887, of the oscillatory character of the transmission of electric discharges along wires was the precursor of his work in the wireless field. In conjunction with Professor Chattock he demonstrated the presence of stationary waves on parallel wires and devised a method of measuring them. The following year, in the Mann lectures at the Royal Society of Arts, he demonstrated that pulses travel along conductors with the velocity of light. Thus his discoveries in important respects, appear to have antedated those of Hertz, who in 1891 worked out the theory of these waves. The inscription on the Rumford Medal, which was awarded to Lodge in 1898 for researches in electro-magnetic radiation and the relation between matter and ether, referred to work done "previously to or simultaneously with Hertz on the surging or oscillatory character of the transmissions of electric discharges along wires."

To Lodge we owe the capacity earth, the coherer or single-contact detector, and selective tuning (*i.e.*, the insertion of an inductance coil in series with the antenna for adjusting the frequency so as to prolong the wave train). For this last he took out a patent in 1897, but its basis was the resonance-jar experiment which he had conducted seven years earlier; he later disposed of the patent to the Marconi Company. Lodge was also the first to introduce tuned coupled circuits in receiving apparatus, and his work as a pioneer in wireless telegraphy was recognised by the award of the Albert Medal in 1919.

Other Scientific Work

Other notable achievements included the measurement, in 1899 in conjunction with Dr. R. T. Glazebrook, of the ratio of the electrostatic to the electro-magnetic unit of electricity. His interest in storage batteries led to his appointment as technical adviser to the E.P.S. Co. from 1884 to 1886, which followed several years' study of electrolysis and of the velocity of the migration of ions in electrolytes. The trapping of flue dust by high voltage electrification first engaged his attention in 1884. Other fruitful work was in connection with lightning conductors, photo-electric discharges from clean metals, electrification of crops, and ignition for internal-combustion engines.

In addition to the distinctions to which we have referred, Lodge was F.R.S., Hon. D.Sc., LL.D., and Hon. M.A. He was also an Honorary Member of the Institution of Electrical Engineers, of which he had been a vice-president, and a Local Centre chairman, and by whom he had been awarded the Institution, Fahie and Paris Electrical Exhibition Premiums. He delivered the Romanes Lecture at Oxford in 1903 and was president in 1913-14 of the British Association for the Advancement of Science, having been, in 1891, president of the Mathematical and Physical Section.

American Plant Expansion

PRIVATELY-OWNED American electrical utilities have increased their 1940 schedules of additional generating capacity by more than 250,000 kW in the last few weeks to bring their total of new plant for the year to 1,520,811 kW. Specific additions scheduled for 1941 and 1942, in the same period, have jumped by more than a million kilowatts to a total of 2,877,150 kW.

Including municipal and government generating additions for the same years, 5,802,100 kW is to be added to the nation's generating capacity by the end of 1942. This will raise the total industry capacity well beyond the 46-million kW level.

The revised totals were compiled for the *Electrical World* from both private and Government sources keeping detailed and continuing tabulations of all schedulings of new capacity. The figures cover only additional plant generating units and have not been broadened to include either expenditure or extensions to distribution systems. It is understood that the figures also are available to the National Defence Advisory Commission to show how and where the electrical industry can meet specific loads arising from armament and preparedness programmes. Installations this year will reach a grand total of 1,990,800 kW.

PERSONAL AND SOCIAL

Information regarding new appointments and other matters of interest for this page are welcomed

BRIERFIELD Urban District Council on August 22nd received a letter from **Mr. R. Lonsdale**, their newly elected electrical engineer in succession to Mr. R. C. Hammersley (who received a similar appointment at Gainsborough), asking to be relieved of his appointment. The Council agreed to the request and decided to appoint **Mr. N. Ashton**, of Swinton, to the position. Mr. Ashton, who is thirty-three, is at present consumers' engineer to Eccles Corporation, and was previously with the Salford Electricity Department. He is a member of the I.E.E.

Sir Alexander Roger has been appointed chairman by the Minister of Supply of a special mission, which is now on its way to India, to discuss means of increasing India's production of munitions and other war stores, both for her own needs and to meet those of the forces in the Middle East and east of Suez. Sir Alexander is chairman of a number of companies, including British Insulated Cables, Ltd.

Mr. Ivor G. Evans, A.M.I.E.E., works superintendent and deputy engineer to the Rhondda U.D.C. Electricity Department, has been appointed electrical engineer to the Portland U.D.C. in succession to Mr. F. O. Harber, who, as we have already reported, has been appointed electrical engineer at Bangor. Mr. Evans attended the South Wales Monmouthshire School of Mines, obtaining a silver medal and national certificates. He received his training with Insoles, Ltd., Porth, before going to Rhondda in 1925.

Mr. F. H. Sowerbutts, B.Sc., at present at Ealing, has been appointed assistant mains engineer to the Worcester Corporation Electricity Department. Mr. Sowerbutts was with the Stockport Corporation Electricity Department before going to Ealing.

It is proposed that the annual summer outing this year of the North-Eastern Students' Section of the I.E.E. shall be to Caldron Snout and Alston on September 8th. Ladies are invited. Particulars can be obtained from Mr. G. E. Topping, 40, Cartington Terrace, Newcastle-on-Tyne, 6.

Mr. W. F. Furse, M.I.E.E., of Nottingham, previously a life governor of the Electrical Industries Benevolent Association, is now one of its junior wardens, having subscribed a further £400 to the Association's funds in memory of his son, Flying Officer Charles William Furse, who, as we have already recorded, was killed while flying on active service on July 20th.

Ald. G. A. Gurr, Mayor of Folkestone, has been appointed a director of the Folkestone Electricity Supply Co., Ltd., in succession to **Ald. R. L. T. Saunders**, who has resigned.

The wedding took place on August 21st at St. Mary's Church, Banbury, of **Mr. B. K. Hibbert** and **Miss Joan Bell-Walker.** Miss Bell-Walker is a member of the E.A.W. and is a senior demonstrator on the staff of the S.W.S. Electric Power Co. at Banbury.

Mr. F. J. Pascoe, director, British Timken, Ltd., made a presentation on August 20th on behalf of the directors and staff to **Mr. J. H. Boden,** who has retired owing to ill-health. Mr. Boden has been with the British Timken organisation in Birmingham for twenty-five years. He was the company's first industrial sales representative.

Members of the Midland Branch of the Association of Mining Electrical Engineers recently visited the Welbeck Colliery of the New Hucknell Colliery Co., Ltd. The party was conducted over the premises by Mr. Platts, the manager, and inspected the power house, winding engines and compressed air plant. **Mr. R. Walker,** who presided at the business meeting of the branch which followed, announced that the annual supper would be held in Nottingham on September 28th. It was also announced that a dinner would be held on August 31st at Ashby-de-la-Zouch to inaugurate the sub-branch which was being formed for members residing in the South Derby and Leicestershire district.

Mr. Zoltan Deshaw, a director and general manager of John Ismay & Sons, Ltd., has been appointed managing director of the company. Mr. Deshaw joined the original Ismay Industries seven years ago as technical adviser and later became a director of that company. When John Ismay & Sons was re-formed in 1938, Mr. Deshaw became director and general manager.

The Canadian Marconi Company has appointed **Mr. D. Macdonald** as superintendent of telegraphs of the company's beam wireless telegraph services at its head office at Montreal. Mr. Macdonald commenced his telegraph career as messenger in the British Post Office in 1893. In 1905 he joined the Marconi International Marine Communication Co. as wireless operator, and early in 1907 transferred to the Canadian Marconi Co., by whom, in 1911, he was appointed to the transatlantic wireless telegraph station at Glace Bay. In 1923 he joined the company's head office staff, and in 1926 was transferred to the traffic production staff at Toronto.

Obituary

Mr. F. Teague.—Another of the prominent pioneer figures of electrical engineering in Great Britain, Mr. Francis Teague, died at Bath on August 19th, at the age of seventy-eight. For twenty-four years, until his retirement through ill-health in 1925, he was the City electrical engineer of Bath, and subsequently acted as consulting electrical engineer to the city. Mr. Teague was born in London, and in 1886 joined the Acme Co. He invented an early AC meter, and was associated with the original electric lighting installation at Holborn Viaduct. In 1890 he left the company and occupied positions as electrical engineer, first at Coatbridge and then at Paisley, while in February, 1901, he went to Bath, on the retirement of the city electrical engineer of the period, Mr. C. F. Metzger.

The Bath power station during Mr. Teague's control was reorganised and enlarged on a number of occasions, including the replacement of reciprocating engines by turbines, while he was largely responsible for the extensive development and utilisation of electricity throughout the West Wilts area. He married the daughter of Theophilus Varley, who introduced the electrical telegraph into the South Island of New Zealand, and the niece of Cromwell Varley, at that time a leading figure in the electrical world.

Ald. T. Shires.—The death occurred on August 24th of Ald. Thomas Shires, who was chairman of the Huddersfield Corporation Electricity Committee from 1928 until his retirement from office last year. He was Mayor of Huddersfield from 1931 to 33.

Mr. Frederick McGowan Bell, of Didsbury, Manchester, whose death has occurred at the age of seventy-five years, was founder of the firm of F. M. Bell and Co., lift manufacturers, of Trumpet Street, Manchester, 1. He was a well-known electrical and hydraulic engineer in the district.

Lighting Fittings and Purchase Tax

AT a meeting on August 2nd of the Industrial Section of the Electric Light Fittings Association it was decided to make contact with the Customs and Excise Department with a view to ascertaining what lighting fittings were subject to Purchase Tax, and what were not. This contact has now been made and the following classification has been agreed :—

FITTINGS SUBJECT TO PURCHASE TAX AT FULL RATE:—

1. Decorative and domestic lighting fittings of all types, including bronzes; bracket and wall fittings (including panel fittings); ceiling fittings of all descriptions; crystal fittings; electroliers; floor, table and desk standards of all descriptions; pendants of all descriptions; silk, vellum, glass and other shades, panels and reflectors used in conjunction with the foregoing. (See Schedule 2 Fair Trading Policy.)

2. Commercial lighting fittings, comprising all types of utility fittings with glass diffusing, reflecting, or protecting medium. (See Schedule 3, Category 2, Fair Trading Policy.)

3. Hand lamps of all descriptions, including inspection lamps.

FITTINGS NOT SUBJECT TO PURCHASE TAX:—

4. Industrial lighting fittings.—Fittings of sheet metal construction with reflecting surface of vitreous enamel, or other medium, with or without glassware; cast iron and other fittings such as bulkheads, well glass and prismatic type fittings, vapour-proof, gasproof, flameproof and mining type fittings; outside lanterns; ships' fittings of an industrial type; outdoor floodlighting units. (See Schedule 3, Category 1, Fair Trading Policy.)

5. Street-lighting units.—(See Schedule 3, Category 3, Fair Trading Policy.)

6. Fittings accessories.—(See Schedule 4 Fair Trading Policy.)

7. Shop window reflectors.

8. Fittings of a kind used exclusively for hospital or surgery work.

It is considered that these definitions which generally follow the schedules in the Fair Trading Policy and the Limitation of Supplies Order will be sufficient to prevent any misunderstanding. It is, of course, understood that the Purchase Tax does not apply, in any case, to export.

A committee has been formed, called the "Purchase Tax Electrical Industry Committee" consisting of representatives of the following bodies:—Accumulator Makers' Association, B.E.A.M.A., Cable Makers' Association, E.C.A. (Scotland), E.L.F.A., E.L.M.A., E.W.F., Incorporated Association of Electric Power Companies, I.M.E.A., N.E.C.T.A., and Provincial Electric Supply Association.

The terms of reference for this committee are:—(1) To render the utmost service to the Government Departments in carrying out the provisions of the Finance (No. 2) Bill. (2) To facilitate the exchange of views on the Bill. (3) To consider any action that may be necessary or desirable.

Several points of possible difficulty with regard to the operation of the Bill have to be settled; for instance, the wholesale price of electrical goods under the Act and "home consumption prices for export declarations." Such points are to be considered by this committee and any decisions arrived at with Government Departments will be made known later.

DECONTAMINATION OF PLANT

Recommended Methods

A COMMITTEE was recently convened by the North-Eastern Electric Supply Co., Ltd., to consider methods of decontaminating electrical plant after exposure to gas. The members of the committee were Messrs. C. C. Coote, T. M. Ayres, F. Scott and C. H. Barber (North-Eastern E.S. Co.); Mr. J. Thompson (Post Office Telephones); Mr. A. Archbold (Newcastle and District Electric Lighting Co., Ltd.); Mr. R. Cowans (A. Reyrolle and Co., Ltd.); and Messrs. E. E. Ward and J. W. Taylor (C. A. Parsons and Co., Ltd.). The report which the committee has prepared has been examined by the Ministry of Home Security, which has approved its circulation to all electricity undertakings, and accordingly the Electricity Commissioners have sent copies to all local authority and company undertakers, Joint Boards and Joint Electricity Authorities.

Possible methods of contamination are considered, and general principles of dealing with affected plant and materials are set out. It is stressed that the officer supervising the decontamination of electrical plant should have sufficient knowledge of the construction and functions of the plant to avoid risk of damage, accidents to personnel and prolonged stoppages. In general, contaminated plant can be allowed to continue to function, but care has to be taken that personnel is protected against possible dangers.

If it is considered that as a result of unusually long exposure to exceptionally high concentrations, vapour may have been absorbed or dissolved, the affected parts should be treated as recommended in the accompanying table.

SUGGESTED METHODS OF DECONTAMINATION

Material	Effect of liquid persistent gas	Decontamination method suggested	Effect on apparatus of decontamination residue	Remarks
Bare metal surfaces	Liable to cause slow corrosion except in the case of gold, platinum, etc.	Remove contamination with solvent.	Residue, if any, should be clean mineral oil only. No effect.	Surfaces being non-absorbent no difficulty should arise.
Wire insulating materials: silk, cotton, wool and artificial silk—waxed.	Rapid penetration of waxed material. No marked rotting produced.	Replace. If not immediately possible bleach paste will make safe for personnel.	Material to be destroyed.	No method of decontamination satisfactory for highly absorbent material unless items can be boiled in water without damage.
Do., unwaxed	Immediate penetration of material. Substantial damage unlikely.	Replace or bleach paste.	Some slow loss of strength likely and perhaps eventual disintegration.	Insulation loss caused by paste; seldom possible to avoid scrapping.
Rubber	Slowly absorbed. Lewisite may be destructive to materials. Mustard gas has little action.	Bleach paste (unless contamination well soaked in)	Probably damage will slowly develop if gas has got well below surface.	When contamination has been severe, total destruction recommended.
Enamel	Absorption slight and slow. Destruction of the enamel possible by Lewisite.	Bleach paste. Suitable solvents.	No substantial effect. Bleach paste should be washed off after two hours.	—
Power cable covering ...	Rapid penetration of compound and braiding.	Bleach paste followed by replacement of compound and braiding; or destroy.	If compound and braiding are replaced fairly soon no effect on rubber.	No suitable treatment for compound and braiding.
Rubber compounds	Penetration fairly slow unless temperature is high.	Bleach paste if possible within 15 minutes, otherwise destroy.	Slow development of trouble, e.g., brittleness, quite likely.	If bleach paste is put on almost at once and wiped off an hour later no damage may result. If gas has soaked in paste must be left on longer; second application may be required.
Slate	Fairly impervious. No chemical action.	Bleach paste or suitable solvents.	None.	If treatment applied quickly solvent removal method would be suitable.
Fibre	Rapidly penetrated. Some slow attack of material.	No method satisfactory. Destroy.	—	Fibrous, porous and in general absorbent materials difficult to decontaminate sufficiently to ensure safety of personnel in confined spaces. Surface can be made temporarily safe by smearing bleach paste but gas is liable to work out from the interior weeks after contamination. Immersion in boiling water for several hours is generally effective, as is also exposure to weather for a few days or weeks, but such methods would seldom be applicable to electrical equipment.
Micanite	Penetrated. Some slow disintegration possible.	Do.	—	
Asbestos	Rapidly penetrated. No chemical action.	Do.	—	
Soft wool	Absorbent. Some slow chemical attack possible.	Do.	—	
Felt	Very absorbent. Slow attack of material.	Do.	—	
Unglazed porcelain	Absorbent. No action.	Do.	—	
Carbon	Absorbent. No action.	Do.	—	
Hardwood	Slowly absorbent. Some slight and very slow chemical attack possible.	Bleach paste, repeated application if necessary, or dry sand and bleach scrubbed in.	No important effect, except to the appearance of the surface.	With furniture, hasty decontamination very dangerous. In case of slightest doubt items should not be used.
Electrolyte	Mustard gas (density 1.28) would sink to the bottom; electrolyte would act as seal and also would slowly destroy the gas. Lewisite would sink and would be quickly destroyed. In either case acid must be changed.	Changing of the electrolyte should only be undertaken by a "gas" specialist.	—	Cells could be used with safety if absolutely necessary. Excessive gassing must be avoided. Staff should avoid battery room; prevent ventilation between it and the rest of the building; encourage ventilation between it and the open air.
Lead plates { **Below surface** ...	Some slow destructive action.	None needed.	None.	Immediate renewal not necessary, but plate life likely to be shortened.
Above surface...	Not absorbed by smooth lead surface. No action.	Removal of contamination by solvent treatment.		
Painted surfaces	Absorbed at rate dependent on hardness age, etc., of paint. No rapid chemical action.	If possible to apply before substantial absorption, bleach paste; if not, caustic soda.	Paint will probably have to be renewed.	New paint very absorbent. Caustic soda strips off paint and neutralises gas simultaneously.
Enamel (decorative)	Penetration very slow.	Removal by solvent, if soon enough, otherwise bleach paste.	None if decontaminant removed as soon as safe.	Enamels stoved at high temperature are, in general, resistant to mustard gas.
Cellulose (lacquers)	Effect depends on nature of the lacquer.	Bleach paste or suitable solvent.	Surface appearance likely to be spoilt.	Usually difficult to decontaminate.

The report details methods of dealing with various items of equipment and a brief classified summary of these follows:—

Switchboards, Switchgear, Control Panels, Motor Starters, etc.

(a) Insulating panels and metal parts of switches: Drops of liquid gas should be removed with rags soaked in solvent and excess solvent removed with clean rags. Gross contamination may necessitate the dismantling of the gear.

(b) Paint and ironwork: Unpainted ironwork should be treated with rags soaked in solvent. Painted surfaces should be treated with bleach paste; in some cases solvents may be effective. Stripping and repainting may, however, be necessary.

(c) Contactors or relay coils: These should be treated or sprayed with solvent, care being taken to avoid contaminating neighbouring apparatus.

(d) Panel wiring: It will usually be found necessary to re-wire completely.

(e) Motors, generators and rotary convertors: After wiping affected parts with solvent-soaked rags the machine should be run on load as near the rated output as possible, when the heat generated will vaporise any remaining liquid. Adequate ventilation and protection of personnel are essential.

Cables.

Lead-covered: The undamaged sheath should be treated with solvents; damaged parts should be replaced as soon as possible. As a temporary measure the damaged sheath may be removed and the insulating material smeared with bleach paste or ointment, which should be left on for an hour and then wiped off.

V.i.r., low voltage: The contaminated portion should be removed as soon as possible. If the renewal cannot be undertaken immediately the affected surface should be smeared with bleach paste, the braiding removed and the whole bound with insulating tape.

Should cables be exposed but undamaged in a contaminated crater and cannot be made dead, the crater may be filled with clean earth and bleach powder until they can be conveniently re-examined.

Wiring and Lighting Fittings.

(a) Conduits and conduit fittings, which are usually run on the surface, will require the same treatment as walls and ceilings.

(*Concluded at foot of next page.*)

CORRESPONDENCE

Every letter must be accompanied by the writer's name and address preferably, but not necessarily, for publication. The Editors cannot accept responsibility for correspondents' opinions

Domestic Load

WITH reference to Mr. G. O. McLean's article on this subject in your August 16th issue I should like to make the following comments:—

The load curves reproduced in fig. 2 are remarkable for various reasons. According to the additional particulars given, the "all-electric" flats in question consumed an average of approximately 8,250 kWh per year, which is comparatively high for places where two 1-kW radiators are all the electric space-heating appliances included in the standard equipment. A rough integration of the two load curves results in approximate consumptions of 35 kWh per flat on the winter Sunday and 25 kWh on the summer day, the difference being 10 kWh or about 30 per cent. of the winter consumption. This leads to the conclusion that space heating is to a large extent derived from sources other than electricity.

Another point is the abnormal shape of the winter curve lacking the towering cooking peak hitherto thought characteristic. I refer, for instance, to the load curves of the Walton Hall Estate, Liverpool, published in the "Proceedings" of the 44th Annual Convention of the I.M.E.A. Incidentally, those houses, relying practically exclusively on electricity for space heating, have an average annual consumption of 4,000 kWh only. I also miss the usual bedroom heating peak around 10 p.m.

In conclusion, I feel that the curves in question cannot be considered as typical for a broad average of "all-electric" households. It would be interesting to know the size of the flats and the income-class to which the tenants belong.

London, W.2, *August 22nd.* P. SCHILLER.

"Too Old"

There have been a good many grumbles like that of "Too Old" in your issue of August 16th during the past six months and the letters have one characteristic common to them all, namely, the inability of the writers to see any but the one fact in the situation—that they, individually, have not secured the appointment they want. There are a large number of aspects to this question, but the principal one is the simple fact that the need of the nation to-day is for skilled artisans. We cannot get enough of them and the need is so urgent that we are "making do" with "dilutees" and trainees who are by no means always a blessing and a help.

It is very easy to get supervisors, in fact the market is full of them, and some of them are genuinely good men, but a moment's consideration shows how small is the number required. It varies, of course, with the process, but as an average it may be said that in any ordinary factory or contracting firm where a fairly large number is employed it is not more than:—Chargehands, 2½ to 5 per cent. of the workers; foremen, 0.5 to 1.0 per cent.; and outside managers, about 0.2 per cent. Thus it will be seen that one manager only is required for every 500 men started and this may be considered high or generous for a wartime organisation.

There can be no doubt that *every* man with skill is urgently needed and the writers may dismiss from their minds altogether any question of age coming into the consideration. The only questions the employer will ask himself are these:—Is he technically able, physically fit, and willing to do the job and likely to pull his weight?

Most of the writers of these letters are men who have been accustomed to run their own businesses or have held positions of responsibility, and whose work has come to an end. I have lately had applications from three first class British engineers who are refugees. There are also a large number of representatives who were trained as technical men but quickly switched over to commercial pursuits, and their technical experience is relatively small. A big number have been earning, say, £600 to £1,000 per annum, and were probably well worth it, but only in the job they were doing. Most of them are greatly disappointed or offended if one offers them a start as artisans (if they will join the appropriate Trade Union) but the fact of the matter is that in wartime it is only in the capacity of skilled artisans that their services are needed. We who have to consider their applications are genuinely sorry for them, but we cannot remedy the situation at the moment, we hardly feel justified in offering them jobs as fitters, electricians or draughtsmen. We feel certain that their technical knowledge and skill and methods are probably out of date for the particular job but that they will be better than dilutees and soon pick up the threads again in their anxiety to get on.

Probably the most important and most hopeful aspect of the situation for such men is that the sudden demand upon industry made it essential on the outbreak of war for the immediate expansion necessary to be made with the material immediately to hand. There was no time to pick and choose. The result is that there are in war factories and Government Departments which have expanded men whose employers would gladly replace with others of *proved* ability. The cream always comes to the top amongst employees and if unwanted men of ability would only face the situation from the point of view of hard-headed practical sense and see that any employment is better than none since it means not only earnings (and after all the artisan's £300-£400 a year is far from starvation wages) but opportunities as well. They will soon find their merits recognised and their abilities and energies sought after.

August 19th. M.I.E.E.

Earth-leakage Protection

In his article on the I.E.E. Wiring Regulations in your issue of August 23rd Mr. Gilbert clearly indicates that he disapproves of the use of water mains and cable sheaths as earth electrodes for earth-leakage circuit-breakers. I agree with him. Water mains and cable sheaths should never be used with earth-leakage circuit-breakers; they are far too good to waste on such a purpose! By all means avoid the connection, but do it by dispensing with the earth-leakage circuit-breaker, not by ignoring the perfectly good low resistance earth electrode so kindly provided by the electricity supply undertaking or the water company. Plenty of engineers would be only too glad to have such electrodes available. Mr. Gilbert should ask contractors in large urban areas what they think of cable sheaths and water mains as earths. They would soon tell him that they would be hard put to it to find anything better. Earth-leakage circuit-breakers undoubtedly have their uses, but protection of metalwork where water mains and cable sheaths are available for ordinary earthing is not one of them.

Mr. Gilbert says that the uselessness of such electrodes for earth-leakage circuit-breakers can easily be proved, and then proceeds to give two examples. But these cannot be regarded as proofs. They are merely illustrations of the German's dogged adherence to an idea—miscalled "thoroughness"—the idea here being that earth-leakage circuit-breakers are the ideal form of protection in all cases, no matter what difficulties this involves or how much better protection may be attained by other means. If an earth-leakage circuit-breaker is rendered inoperative because live metalwork is in contact with the cable sheath or water main to which it is earthed, I have very little doubt that these electrodes which Mr. Gilbert despises will live up to their reputation and pass sufficient current to blow the fuse.

Finally, I would like to draw attention to Mr. Gilbert's inquiry whether engineers still believe that the voltage-operated earth-leakage circuit-breaker is actuated by the leakage current flowing between protected metalwork and the earth electrode. If "the leakage current" is changed to "a leakage current" I do not see how any engineer could believe anything else. But perhaps Mr. Gilbert intended the significance of the whole question to depend on the definite article. Perhaps he fully intended to imply that there were always other parallel paths through which the leakage current could flow.

H. G. TAYLOR.

London, S.W.1, *August 27th.*

Protection of Windows

The following may be of interest to your readers.

In a showroom building of one of our undertakings a rear window measuring approximately 5 ft. 6 in. by 4 ft. glazed with ¼-in. plate was exposed to the blast from a bomb. It had been protected by means of 1-in. adhesive tape obtained through E.D.A., the tape being arranged in squares 10 in. between centres.

The window was badly smashed but remained in large sections. One piece, measuring approximately 18 in. by 30 in., was found dangling on the tape inside the window. By preventing this piece from falling and generally holding the window together the tape certainly proved its value in this instance.

A. M. HARKER,
Secretary,
Electric Supply Corporation, Ltd.

London, E.C.2, *August 23rd.*

Decontamination of Plant

(Concluded from preceding page)

(b) Electric lighting fittings should be removed. Drops of contaminating liquid should be wiped off and the fittings swabbed with solvent and washed.

(c) Flexes should be destroyed and replaced.

Insulation.

Methods of treatment are set out in the table.

When the expedient of "weathering" is adopted, care should be taken that warning notices are posted and the public kept clear until an expert has decided that the plant or site is free from contamination. Discrimination in the use of solvents is counselled, and a list of these is given in the report. The most convenient and cheapest is paraffin; oils leave a sticky surface to which dirt adheres; petrol, alcohol, methylated spirit, carbon tetrachloride, carbon di-sulphide and mono chloro-benzine can all be used with suitable safeguards against fire or toxic effects.

NEW ELECTRICAL PRODUCTS

A Review of Equipment Recently Marketed

Hand Carbon Arc Torch

THERE are a large number of instances in which, due to high initial cost or for other reasons, automatic or semi-automatic carbon arc welding cannot be employed, particularly in the case of light sheet metal work involving

Hand welding torch

short or irregular runs in medium quantities.

To meet such requirements as these SIEMENS-SCHUCKERT (GREAT BRITAIN), LTD., Great West Road, Brentford, Middlesex, have developed a carbon arc torch for hand welding. Two sizes are available, for up to 80 and 160 A, suitable for welding material from 20 SWG to $\frac{3}{16}$in. Any size of carbon up to $\frac{1}{4}$in. diameter can be used as required, without making any adjustment to the torch.

A powerful blow-coil incorporated in the carbon holder ensures a steady arc, this being necessary in order to obtain consistently good results. Special attention has been paid to fatigue, and in addition to reducing the weight to the practicable minimum, the balance has been carefully adjusted to minimise strain on the operator.

Distribution Accessories

A fresh range of underground cable disconnecting boxes with detachable sealing chambers to facilitate jointing and ease installation in awkward situations is announced by W. T. HENLEY'S TELEGRAPH WORKS CO., LTD., Milton Court, Westcott, Dorking, Surrey.

Chambers with blanking covers are available in straight, right-hand and left-hand angle types, all interchangeable and complete with bolt-on type brass wiping glands, armour clamps being fitted if required. The boxes are of the four-way and six-way non-selective and six-way selective types suitable for working at up to 500 V.

The interior conductor fittings, to which are bolted the tinned brass cable connectors in the sealing chambers, are extended through the walls of the box, enclosed in bakelite insulating sleeves and positioned by wood diaphragms. High-rupturing-capacity cartridge fuses are interchangeable with wedge type links. When supplied with fuses, bakelite lifting bars are fitted as standard, but porcelain fuse carriers can be substituted if desired.

Cable Refrigeration

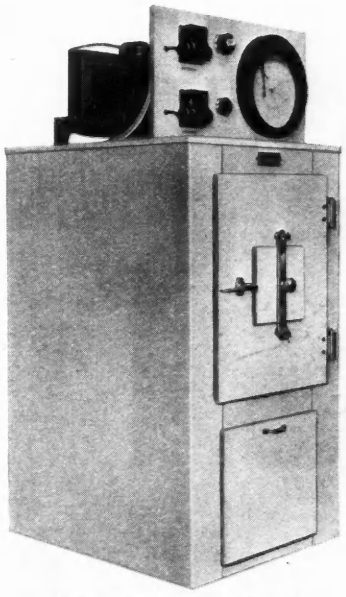
Weatherproof overall finishing compounds for cables for overhead lines may frequently be subjected to wide variations of temperature in use, particularly in the tropics. Similarly, lacquered cables have to operate within a temperature range of the order of minus 10 to plus 120 deg. F. in the more exposed parts of aircraft, so that Air Ministry specifications incorporate tests relating to the effect of cooling on the flexibility of cables, both with and without the overall braiding and lacquer.

The procedure involves the placing of a sample length in a low temperature atmosphere for a definite period and then bending it round a mandrel at the same temperature level. Should future specifications for aircraft cables also incorporate fatigue tests on metallic conductors when subjected to low temperatures as well as the effect of vibration on cables when installed in conduit, or conductor metals other than copper be considered for saving weight, then refrigeration at closely controlled temperatures would be likely to assume considerable importance in the testing of electric cables.

COLDAIR, LTD., subsidiary of the General Electric Co., Ltd., Magnet House, Kingsway, London, W.C.2, offers equipment for this purpose consisting of a cabinet finished in white enamel outside and 2 ft. 5 in. square by 4 ft. high overall. It has a stippled glazed sheet interior, fitted with two galvanised bar type shelves 1 ft. 6 in. square by 2 ft. high.

The condensing unit, which comprises a standard cooling coil and compressor driven by a $\frac{1}{3}$-HP motor, is at the top of the cabinet behind a control panel on which are mounted a large recording thermometer and two thermostatic controls with ranges from minus 20 to plus 10 deg. F. and 15 to 45 deg. F., respectively. A rotary switch for changing over to the thermostatic control in the range desired is included together with a defrosting switch to operate a small air circulating fan inside the cabinet.

The simple procedure is to place the cable in the refrigerator cabinet, where it is left for periods of 3 to 21 days depending on type of cable and purpose for which it is intended. A small door in the main access door to the cabinet is fitted over an open observation aperture

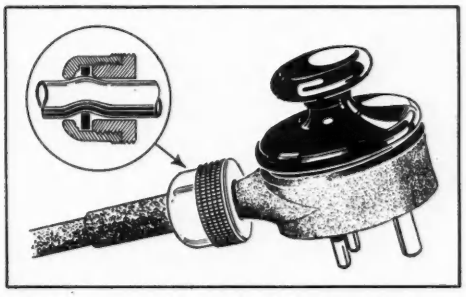


Coldair refrigerator for cable testing

through which samples can be withdrawn as required during or after experiments. The Gloster Aircraft Co. uses a Coldair cabinet in the manner described.

"Flexgrip" Plug Protectors

The strain to which an outlet connector is subjected when a plug is carelessly wrenched from its socket can be prevented by fitting the "Flexgrip" (Conradi patent) made by the British Central Electrical Co., Ltd., 6, Rosebery Avenue, London, E.C.1. It is made in the form of a toughened rubber band, which is easily fitted to round plugs with the aid of a tapered (expansion) block supplied for the purpose. The flexible connector is threaded through a relatively long rubber sleeve which is firmly moulded to the plug band with reinforcing fins which prevent acute angle bending of the cable and harmful fraying. The non-slip grip is achieved by means of a flanged bush and thimble cap which are screwed together, enclosing a washer that is eccentrically drilled to exert lateral pressure upon the cable within the protective sleeve, so preventing the former from



Rubber "Flexgrip" plug protector

sliding within the latter and transferring the strain to the resilient band around the periphery of the plug base.

Shelter Signs

Illuminated external warning signs for A.R.P. shelters erected in the streets are obtainable from the GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, London, W.C.2, for operation off the mains or batteries.

Their installation entails the minimum weakening of the shelter walls; for example, the type made to fit cornerwise on shelters that protrude into the roadway occupy the space of a single brick, having a wired glass panel with a red arrow for directing traffic away from the structure.

For shelters situated in the centre of roadways, a slightly larger fitting is recommended, incorporating a full-size St. Andrew's Cross sign. Another type which may be required at the sides of shelters in addition to the corner fittings consists of a single wired glass panel with either plain red glass or a red arrow.

Producing Powdered Iron

A METHOD of producing powdered iron with the aid of gas is proposed to be used by the Clark Iron Co., Inc., of California, which is expected to build a plant near Los Angeles with an output of 20,000 tons a year. Two pilot plants have supplied enough information to warrant commercial production, says *Reuter's Trade Service*. The market for powdered iron has become attractive as a result of the stoppage of Swedish imports. The powder, which averages 300 mesh, is compressed in metal dies and sintered to manufacture parts that are often less expensive than castings and forgings owing to the fact that they are of exact size and need no machining. They can be impregnated with oil as a result of their porous nature.

California is reported to have abundant iron ore, but lack of coking coal has been an obstacle to the development of ore deposits for western industries. Coal could be brought in, but has proved to be too expensive because there is no market for by-product gas in a natural-gas country.

In the new method crushed and screened ore is roasted at 1,550 deg. F. and then fed into reduction tubes, where the process is accomplishd at temperatures not exceeding 1,900 deg. F. in hydrogen derived from natural gas. The gas is not used for fuel, as the heat required is furnished by electricity.

Gas reduction of solid iron ore by a low-temperature process should permit selective reduction of the iron alone, whereas blast-furnace temperatures reduce oxides along with the iron. Theoretical advantages of low-temperature treatment are low cost and high purity compared with pig iron, a spongy or powdery end product, and ability to deliver iron containing stated percentages of carbon.

ELECTRIC LAMP PUBLICITY

Adaptation to War Conditions

THE lighting restrictions will again affect the sales of electric lamps for exterior use during the coming winter, but much of this loss can be counterbalanced by increased illumination in factories, commercial and domestic premises, and the new publicity material which has been prepared by electric lamp manufacturers indicates that they are fully alive to the possibilities of increased sales in these directions.

In the interests of national economy, the material available is not so abundant as in other years; nevertheless there is a wide assortment of attractively coloured showcards, window display material and literature from which the dealer can choose.

British Thomson-Houston Co., Ltd.

The quality of "Mazda" new season publicity maintains the high standard of previous years. It includes a striking window display which links up the lights of other days with "Mazda—The Nation's Light of To-day." The display is printed in fourteen colours and is made in two planes. It does not depend on illumination for its effect, but an aperture in the platform between the two planes allows for a lamp to be inserted for use in the daytime, or at any time in a showroom. The height of the display is 29¼ in.; width, 27¾ in.; and depth, 5 in.

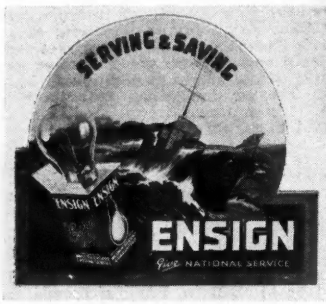
Other items are a distinctive showcard and a window sticker. The former is an attractive design in colour carrying the motto "Save, by using Mazda Lamps." The window sticker is made of paper and is adhesive back and front so that it may be affixed on either side of the window. The design for this is taken from the centre portion of the showcard.

Showbills also advertising "Mazda" lamps will be seen on escalators, tube lifts, and carriages of the Underground Railways. These showbills will be replicas of the showcard design. The company is also issuing an abridged price list covering all types of "Mazda," "Mercra" and "Sodra" lamps for general and industrial lighting, which takes the form of an effective folder printed in blue and black on white.

Lighting propaganda advertising will be carried out on a large scale in the engineering and industrial Press with "Light Conditioning for Production and Welfare" as main theme.

Siemens Electric Lamps and Supplies, Ltd.

Arrangements have been made to keep the name "Siemens" before the public eye by display advertisements in the national dailies, and in view of the necessity for speeding up output from factories, special attention will be devoted to better lighting in these premises with Siemens lamps and lighting equipment and to this end the company has arranged for display advertisements to appear in the principal trade journals.



A "Mazda" showcard (above), an "Ensign" window cut-out (left), and a "Kye" display cut-out (right)

For window displays the "vase" centre-piece with the slogan "Siemens lamps brighten the Home," which proved so popular last year, will again be available, and the company is prepared to dress dealers' windows with their lamp display using this piece as the central feature. Supplies are also available of last year's "Judge" showcard which carries the slogan "The Verdict of all Good Judges—Siemens for Raliability." In order to conserve paper no broadcast of price lists will be made, but these will be available for the trade. Ample stocks of Siemens lamps have been built up.

Crompton Parkinson, Ltd.

Crompton and "Kye" lamp advertisements will appear in the national Press and selected periodicals. The company has some attractive window display material again for the coming season. The window display cut-out for Crompton lamps is printed in six colours and in two planes, the overall size being 38½ in. high by 28½ in. wide. The front plane is a reproduction of the lamp and carton and the background carries the slogan "You need a good light," which has been decided upon for the season. The design is a strong but simple treatment in attractive colours. The same display in miniature is adapted for counter use, with the addition of a pocket formed across the base to hold leaflets. The size of this showpiece is 14½ in. high by 10 in. wide. There is also a showcard of a different design for use either in windows or on counters. It carries the same slogan as the cut-out display, and in addition ties up with the proposed Press announcements by the inclusion of a silhouette which is to be the basic idea of the Press advertising. This card is printed in five colours. A price list giving details of a wide range of lamps is being distributed.

For "Kye" lamps the display cut-out realistically simulates a lamp shade beneath which is a hand holding a lamp just about to insert it in the lamp socket. The slogan running through the advertising is "Kye in the socket—saves your pocket." Prominence is given to the low price, and the whole is printed in nine colours. The counter showpiece is a small reproduction of the one just described, but in one plane instead of two.

The new "Cosmos" window display cabinet (above), and the Siemens "Judge" showcard

A separate showcard will also be available, carrying the slogan "When you buy, insist on Kye." This design has also been turned into a window bill of the same size (14½ in. high by 9½ in. wide), and is printed in seven colours. Last season, Crompton's issued a cardboard lamp shade advertising "Kye" lamps. It was designed to represent stars on a blue background with the name "Kye" and the price. This proved so popular that it has been decided to reissue it during the coming season.

A feature of the "Kye" counter leaflets in the past has always been some trick or unusual cut in the design to drive home a selling message. This year the same thought has been applied, and the cover of the leaflet depicts the body of a man with his hand in his pocket. By withdrawing the hand from the pocket the folder opens and reveals the "story." The folder is in colour.

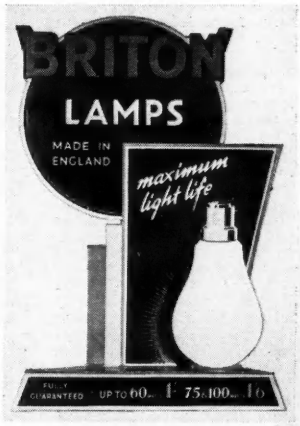
Metropolitan-Vickers Electrical Co., Ltd.

"Be 'light' hearted," the "Cosmos" slogan for this season had to be decided upon early this year when it was impossible to forecast the trend of the war. Since then many things have happened to cheer and depress us, but Metropolitan-Vickers still feel that their optimistic slogan is not misplaced. Good lighting will create a light-hearted feeling to effectively combat the black-out and any feeling of depression.

The new "Cosmos" window display consists of a handsome cabinet flanked by two side panels of topical interest which can be placed to suit the size of the window or show-

room space. In the centre of the cabinet is a small lighted compartment containing a mystifying device in which a "Cosmos" lamp appears to dissolve into a lamp carton. With the relaxation of the Government restrictions on lighted window signs this device will be a considerable asset in any showroom window. A small "Cosmos" lighted box sign is also available featuring the "Be 'light' hearted; switch to Cosmos lamps" slogan.

A wartime sales aid is the "Cosmos Advertape," which combines utility with an unobjectionable amount of advertisement. This transparent tape, 3-in. wide, which allows the customer to see the contents of the window without hindrance, is fastened to the showroom window by a special adhesive and minimises risk of shattered or flying glass during an air raid. A considerable supply of "Cosmos" rubber floor mats, showcards and folding units are also available.



A "Briton" showcard (above) and a new "Lotus" lamp display piece (right)

Ensign Lamps, Ltd.

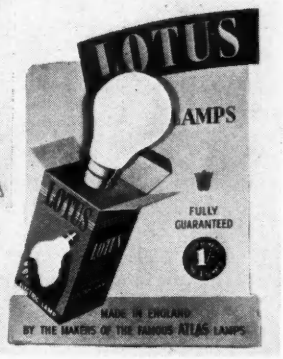
During the current week this company is circulating to the trade a broadsheet giving full details of its season's programme. A number of window displays have been prepared, two notable examples being the familiar picture of one of the lions in Trafalgar Square with the slogan "Ensign, the Lamp for National Service," and another a cut-out of the lamp in the centre of attractive cartons and with the wording "Ensign Lamp—A Brilliant Performance." A topical flavour is given to a new window cut-out illustrating a ship ploughing the seas with its ensign flying, which bears the slogan "Serving and Saving—Ensign give National Service." Full-page advertisements will appear in selected media.

Thorn Electrical Industries, Ltd.

The principal feature of this company's lamp campaign is the new "Lotus" lamp which it has just put upon the market. These lamps are in a range of 25, 40, 60 and 100 W, both clear and pearl. The trade discount and trading policy will be similar to those for "Atlas" lamps. Attractive literature is available relating to the new lamps, large stocks of which are already held by the company's various depôts. A handsome catalogue has been produced in which particulars are given of the range of "Atlas" lamps, those for decorative lighting being illustrated in colour. Among the lamps catalogued is a 5-8-W economy lamp, a coiled coil range and two types of A.R.P. lamps, "O.D." and shielded types. Illustrations and details of a varied selection of sales aids are also included. Prominent among these are a 16-sheet poster in bright colours on black background, advertising the "Atlas" lamp, a showcard, window bill and a 6-page folder relating to A.R.P. lamps, and a large window display centre-piece in red, yellow, blue and black, which includes a parchment lamp shade in which an "Atlas" lamp can be fitted. The illuminated display which shows a man's face, alternatively frowning and smiling as the "Atlas" lamp comes into action, was in such demand last season that it is being continued this year.

John Ismay and Sons, Ltd.

A number of attractive sales aids for their "Briton" and "Relma" lamps have been prepared by John Ismay and Sons, Ltd. The principal feature of the "Briton" lamp publicity material is a showcard the predominant colours of which are red yellow and black, with a cut-out of the lamp in white resting on a platform. An effective card giving the prices of clear and pearl lamps is also available.



A handsomely produced catalogue has been issued covering the wide range of "Relma" and "Briton" lamps. The former include clear and pearl lamps, daylight, opal and colour-sprayed lamps and architectural types, while the decorative lamps and tubes are illustrated in colour. A handy at-a-glance reference leaflet is also available, giving wattage, standard voltage and price per lamp of "Relma" lamps, including tubular, candle, traction, standard sign, traffic signal and daylight types. As in previous years, the company is confining its advertising to the usual trade journals, and is not proposing to carry out any window-dressing schemes this year.

We hope to publish in our next issue details of the publicity material which other leading lamp manufacturers are issuing this autumn.

Economy and Efficiency

Results from Committee's Reports

ACTION taken by Government Departments upon recommendations in its earlier reports forms the subject of the eleventh report from the Select Committee on National Expenditure. The first eight reports and a special report are covered. The ninth report, dealing with coal and electricity supplies (ELECTRICAL REVIEW, August 2nd) and the tenth, a study of priority and progressing organisations (ELECTRICAL REVIEW, August 23rd) were issued too recently for considered departmental statements to have been received.

In its second report the Committee recommended the appointment by each Government Department placing contracts of independent officers charged with the duty of constantly reviewing specifications so as to secure the elimination of undue rigidity, multiplication of types, over-elaboration and competition for materials in short supply. It was also suggested that there should be closer liaison between designer and producer. The Treasury has examined in detail the machinery for review of specifications for works and stores respectively, and it believes "that the Departments are fully alive to the importance of the considerations brought out by the Committee . . . and that they are devoting constant attention to improvements in the present position." With regard to the proposed appointment of independent reviewing officers, the Treasury understands that "the Departments concerned feel that the questions of standardisation and elimination of over-elaboration are among the most important duties of Production Departments and would deprecate the appointment of independent officials to deal with them."

Arising out of the Committee's third report, endeavours are being made to give work to the smaller firms. This policy is facilitated by the increased number of term maintenance contracts and urgent works services in connection with home defence.

The sixth report dealt, *inter alia*, with design, specifications and the use of substitutes. The Committee has been informed in evidence of the continuous attention paid by the Production Directorates to the review and revision of designs and specifications and of the work of the Controls under the Ministry of Supply for the more economic use of raw materials and the use of substitutes. A committee to consider the use of substitutes has been set up by the Advisory Council on Research and Development under the chairmanship of Sir William Larke. In addition to members of the Council, two senior officers of the Ministry and representatives of the Admiralty and Ministry of Aircraft Production are on the Committee. Attached to the Committee are also liaison officers from each Production Directorate of the Ministry.

The Committee is required:—(1) To review and advise on the use of alternative materials and of alternative processes of manufacture and fabrication of materials in relation to requirements of defence services; and (2) to consider means of effecting economy in use of materials in short supply and for increasing production.

The Area Boards of the Ministry of Supply have now been reconstituted by the addition to them of representatives of industry and labour from whom the chairmen and deputy-chairmen are being selected. The official members of the Boards will continue in office and be responsible to their own Departments, while the Boards in their corporate capacity will be responsible directly to the Industrial Capacity Committee of the Production Council. The existing Area Advisory Committees will not be formally dissolved but will act in future as consultative committees on engineering questions.

Since the Committee's sixth report was issued action has been taken upon the importation and control of machine tools.

The First Commissioner of Works has examined the question of adapting to wartime requirements the specifications for builders' supplies in common use by Government Departments and a schedule has been issued by an interdepartmental committee covering a wide range of articles. Specifications have been divided into three classes:—(a) For permanent buildings (mainly buildings started before the war and now in course of completion); (b) for buildings which are expected to remain in use after the war; and (c) for purely wartime buildings.

With regard to the Committee's eighth report considerable publicity was given to the Central Register, and this was added to by the Orders requiring the registration of engineers, chemists, physicists and quantity surveyors.

COMMERCIAL and INDUSTRIAL NEWS

July Overseas Trade. Purchase Tax Registration. I.C. Engine Standardisation

Overseas Trade in July

IN reviewing Great Britain's overseas trade in July, the *Board of Trade Journal* points out that the entry of Italy into the war and the collapse of France caused an appreciable reduction in imports, exports and re-exports, as compared with June, but the excess of imports over exports was not greatly affected. In the electrical goods and apparatus section exports, after a fall in June, showed an upward trend, the total of £1,083,296 being £39,456 higher than in the preceding month and £47,912 more than for July, 1939. Imports, however, continued to decline and were valued at £173,301, as compared with £185,692 for June and £245,133 for July, 1939. For the seven months of this year the total value of exports was £8,542,776, an increase of £1,187,196 over the corresponding period of 1939, while imports at £2,422,094 also showed an increase of £738,722.

Registration for Purchase Tax

The Bill introducing the Purchase Tax may be expected to become law in the course of a few days. The first stage in the bringing into operation of the tax is the registration by the Customs and Excise Department of the manufacturers and wholesale merchants concerned. The procedure for registration is explained in a notice issued by the Department and an official form on which application must be made is available. It is intended to bring the tax into operation early in October. The final date for applying to register will be announced shortly, but it is hoped that traders concerned will not leave registration to the last moment. Responsibility for registration rests on the person or firm concerned (irrespective of whether or not a form has been sent to them) and liability to heavy penalties will be incurred by failure to register, as required by the law.

Any trader under a legal obligation to register who has not received a form of application in the course of the next few days should apply to his local Officer of Customs and Excise, whose address may be obtained at any Post Office or to the Custom House, London, E.C.3. Any assistance that may be required in the completion of the form will be given readily by the local Officer of Customs and Excise.

Torch Battery Imports

Substantial and increasing quantities of torch batteries are being produced in the United Kingdom, but it may be necessary to supplement them with imports to ensure adequate supplies for the winter months. So that no time shall be lost in ensuring adequate supplies, the Import Licensing Department of the Board of Trade is compiling a register of importers to whom import licences can be issued if necessary. Firms desiring to import torch batteries are urged to send the following particulars to the Secretary, Torch Battery Imports Advisory Committee, 69, Cannon Street, London, E.C.3, as soon as possible, and, in any case, before September 7th: (1) Imports of torch batteries during the year ended May 31st, 1940, showing c.i.f. value and quantity of each type of battery imported from each separate country. The return should include only batteries for which the applicant was directly responsible for paying the overseas supplier; (2) pre-war experience of the torch battery trade, whether as manufacturer, importer, wholesaler or retailer.

A G.E.C. Spitfire

A suggestion that members of all sections of the organisation of the General Electric Co., Ltd., should combine to buy a Spitfire for the Royal Air Force has been taken up with enthusiasm in all quarters, and moreover a number of subscriptions have been received from members of the firm now serving with the Forces. The immediate response has been so gratifying that it is anticipated the sum required will be available within a very short time.

Paper Works Lighting

The accompanying picture shows a recent lighting installation in the salle of a paper manufacturer, the North Wales Paper Co., Ltd. This has been equipped with Benjamin "Saaflux" RLM reflectors using 300-W lamps mounted 12 ft. high, and, as can be seen, an excellent general lighting is obtained. It will be noted that all the windows are blacked out and, consequently, the appearance presented is that of night time, or it could be taken as typical of what is being done in many factories where black-out conditions also apply during the day owing to difficulty in removing the window coverings.

Benjamin reflectors installed in the works of a North Wales paper manufacturer

Standardisation of I.C. Engines

The *Times* reports that the Industrial Capacity Committee of the Production Council has taken, it is understood, an important decision with the object of reducing the number of types of certain categories of land and marine internal combustion engines (excluding, for example, aeroplane engines and marine engines of 1,500 BHP), required by the Service Departments, and making possible acceptance of the commercial specifications of approved firms. An interdepartmental committee has been appointed to ascertain the requirements by the departments of the specified types of engines and to plan the distribution of orders with the intention, where possible, of standardising specifications and of reducing the number of types and sizes. The committee is also to make recommendations on the removal of impediments to production. Sir James Lithgow, deputy chairman of the Industrial Capacity Committee, is the chairman of the special committee, and in addition to representatives of the Supply Departments, the Internal Combustion Engine Manufacturers' Association and the British Standards Institution will be represented on it.

Employment in July

Employment in the engineering industry as a whole between June 17th and July 15th continued at a very high level and the number of insured persons unemployed showed little variation as compared with the preceding month, but was about 341,000 less than at July 10th, 1939. According to the *Ministry of Labour Gazette* the number out of work in the electrical engineering industry (1,591) showed little change as compared with June, the percentage remaining at 1.3. There was a fall, however, of 1.6 per cent. as compared with July last year. The unemployed in the electrical wiring and contracting industry totalled 1,390, or 3.2 per cent., showing a decrease of 0.2 per cent., as compared with the previous month and of 6.4 per cent., as compared with July, 1939. There was a slight increase of 0.2 per cent. in the number of unemployed in the electric cable, apparatus, lamps, &c., group as compared with June, the total being 5,675. This figure, however, shows a decrease of 1.4 per cent., as compared with the corresponding month of 1939.

Ships' Supplies

In order to facilitate the supply of controlled goods to ships, the Board of Trade has issued open general licences under the provisions of the Limitation of Supplies (Miscellaneous) Order to enable persons registered under that Order to supply certain controlled goods without restriction to approved ships' stores dealers and shipbuilders and for shipment as ships' stores. The articles included are all goods described in para. 9 of the Schedule to the Order, except secateurs, razors and blades, hair clippers and scissors; and the following goods in para. 17: Fans with motors not exceeding ¼ HP; domestic laundering machines (cleaners, washers and wringers); refrigerators with a capacity not exceeding 12 cu. ft.; and electric toasters, irons, plate warmers and kettles.

Australian Import Restriction

A number of restrictions have been placed upon imports of goods into Australia from non-sterling countries, and among the classes affected are the following:—25 per cent. restriction: Dynamos and generators incorporated in or of the type used in lighting sets for bicycles; lamps incorporated in or of the type used in dynamo sets for bicycles. 50 per cent. restriction: Plastic moulding materials; synthetic resins; electric hair clippers. 100 per cent restriction: Controllers for charging current of electric fences; DC mill-type motors up to 75 HP; multiple-purpose wireless valves; carbon brushes.

Maltese Import Duty Surcharge

The Maltese Government recently imposed a surcharge of 20 per cent. on articles subject to the Empire preferential tariff and one of 30 per cent. on those subject to the general tariff. The *ad valorem* duty on electrical goods is 10 per cent. preferential and 20 per cent. general, and that on wireless sets and parts is 15 and 20 per cent. respectively.

Reyrolle & Holmes

The name of Holmes has long been known in the electrical engineering industry. J. H. Holmes & Co. was founded in 1883, and carried on the manufacture of motors, generators, and switchgear in Newcastle-on-Tyne for forty-five years, until the business was taken over by A. Reyrolle & Co., Ltd., in 1928. In 1930 the headquarters of J. H. Holmes & Co., Ltd., were transferred to a portion of the Reyrolle works, and since then, although the separate title has been preserved, Holmes activities have been gradually merged in those of Reyrolle, with considerable extension of designs and manufacturing facilities. It will have been noticed from advertisements and in other ways during the last year or so, that the name of Holmes has been used more regularly than before in conjunction with that of Reyrolle, and that the description "Reyrolle-Holmes" has been applied to the relevant products. In future, as a further step, all the products hitherto

sold by Holmes will be sold in the name of Reyrolle, and past association will be preserved by their being described as Holmes' products.

Extinguishing Burning Metal

For extinguishing burning metals, such as the magnesium alloys, known as "Elektron" : and "Magnalium, aluminium powders, sodium and potassium in the form of machine-tool swarf or grinding room dust, the National Fire Protection Co., Ltd., Petersham Road, Richmond, Surrey, produces "D.X" powder, which is a dark grey mixture of non-abrasive character. It is applied with a shov.. to form a covering, the heat rendering it viscous, so that it percolates between the particles of burning metal and coats the unburned portions with a varnish-like skin. This excludes air, without whose oxygen content the fire cannot continue; in addition, a strongly exothermic reaction takes place, involving the formation of a deterrent carbide compound which further cools the mass.

Final solidification into a cap formation, which may be removed in one piece, often leaves the unburned portion of metal in a recoverable state. For the extinction of incendiary bombs "D.X" powder may be applied with or without a special "494" cooling liquid.

Lighting a Surgical Instrument Forge

At a Bethnal Green factory where surgical instruments are made the forgers judge the temperature of metal bars which they hammer into shape by colour. The range of the correct forging temperatures of stainless steel is narrow, and variations in extraneous light which affect the appearance of the heated metal are disconcerting. Therefore Allen & Hanbury, Ltd., with the assistance of the General Electric Co., Ltd., have installed tubular mains-voltage fluorescent lamps in their forges to provide a clear near-daylight illumination which alleviates eyestrain at the end of the day. A special dispersive reflector is fitted about 7 ft. from the floor directly over each anvil and block which are about 2 ft. 6 in. high. The "Osira" 5-ft. tubular fluorescent lamp is fitted with the standard choke and suppressor and is rated at 80 W.

Trade Announcements

Ensign Lamps, Ltd., has opened a new depôt at 38, Bedford Street, Belfast, and as from September 1st, all sales of Ensign products throughout the whole of Northern Ireland will be dealt with exclusively by this new depôt.

Ersin multicore solder, which is a high-grade solder with three cores of Ersin flux, is now being made available for radio and electrical retailers and engineers, by Multicore Solders, Ltd., of Bush House, London, W.C.2. Single 1 lb. reels of 50 per cent. tin and 50 per cent. lead alloy contain over 90 ft. of solder.

The Committee on Woman Power

On August 20th in the E.A.W. Clubroom at 20, Regent Street, the Committee on Woman Power had its first open meeting with members of the women's professional organisations and representatives of the Press. Miss Irene Ward, C.B.E., M.P., the acting chairman, presided, and outlined the work of the Committee, saying that it was formed to overcome the sense of frustration among women that their services were not being adequately used. It aimed at giving the women of the country leadership and representation in the appropriate quarters of problems regarding their employment during the war. They were desirous of having a part in the creation of policy which was so vital to both the man and woman power of the country. Miss C. Haslett, C.B.E., deplored the attitude which regarded women as "ladies" and therefore meriting gentle treatment rather than a share in responsible work. She emphasised the point made by Miss Ward that a woman should be appointed to the Labour Supply Board.

Baird Television, Ltd.

A petition presented by Baird Television, Ltd., to sanction a scheme of arrangement with the loan stockholders of the company involving an amalgamation with Cinema Television came before Mr. Justice Bennett in the Companies' Court on August 27th. His Lordship directed the adjournment of the petition to October 14th in order to give anyone who wished to oppose it an opportunity of appearing.

E.D.A. and National Window Displays

We have already referred to the topical window displays which have been produced by the Ministry of Information depicting various aspects of the nation's activities. The Electrical Development Association has played an important part in securing the electricity supply industry's co-operation in this direction, and up to the moment of writing this note, it has actually sent out 462 displays. In addition to the material supplied by the Ministry, the Association provides illustrated suggestions for its arrangement and effective use has been made of the matter thus made available. As an example we illustrate herewith the "Wings over Europe" window recently arranged by the Preston Corporation Electricity Department.

This is No. 3 of the Ministry's series; No. 4, which is now available, deals with the work of the Merchant Navy. For this the Association suggests, in addition to the posters and photographs supplied, the provision of a map of the world and examples of food brought from overseas with ribbons connecting the latter with their points of origin on the map.

Preston's version of the "Wings over Europe" display

Power-Factor Correction

On page 126 of the August 16th issue of the ELECTRICAL REVIEW the second illustration of the article under the above heading appears with an incorrect inscription. This should read: "The best place theoretically for the condenser is at the motor; hydro-extractor drive in a laundry."

A.R.P. Training Bulletin

The second of the A.R.P. training bulletins which the Ministry of Home Security is issuing is now available from the Stationery Office, price 8d. including postage. These bulletins are issued for the benefit of instructors, and more particularly those in commercial and industrial establishments who have not the same opportunities for keeping in touch with the latest developments in A.R.P. matters as have local authorities' staffs.

Trade Mark Applications

THE following are among the recent applications for British trade marks, objections against any of which may be entered within one month from August 21st:—

Chlorovene. No. 611773. Class 2 (IV). Artificial resins derived from compounds containing chlorine and compositions consisting principally of such artificial resins. F. A. Hughes and Co., Ltd., Abbey House, Baker Street, N.W.1.

Zeltex. No. 612299. Class 2 (IV). Synthetic resins sold in the form of sheets, rods, bars, filaments, threads, etc. Xelex Products, Ltd., 12, Clarges Street, Piccadilly, W.1.

Stewart-Warner. No. 602850. Class 11 (IV). Refrigerators and parts thereof. Stewart-Warner Corporation, Chicago, Ill., U.S.A. (British representative, C. Lockett Hughes, 46, Bedford Row, W.C.1.

Prices of Materials

The only change in the prices of materials of which we have been notified since August 14th is as follows:—

Henry Gardner and Co., Ltd., report August 28th: English block tin, £258 5s., £4 15s. decrease.

New Catalogues and Lists

W. Edwards & Co., Ltd., Southwell Road, Loughboro' Junction, London, S.E.5.—Folding card, priced, setting out the properties and uses of "Apiegon" products, such as oils for vacuum pumps of the condensation type and greases and waxes for joint sealing.

National Fire Protection Co., Ltd., Petersham Road, Richmond, Surrey.—Illustrated folder describing the action of "DX" powder for extinguishing burning metallic swarf, powder, dust and incendiary bombs.

British Central Electrical Co., Ltd., 6, Rosebery Avenue, London, E.C.1.—Illustrated folder descriptive of rubber band "Flexgrip" strain protector for outlet plugs.

Metropolitan Electric Supplies, Goldstone Crescent, Hove, 4.—Price lists of elements and spirals and of electrical accessories.

Lincoln Electric Co., Ltd., Welwyn Garden City, Herts.—A leaflet giving particulars of the service available to users of Lincoln welding electrodes.

T.M.C.-Harwell (Sales), Ltd., Britannia House, 233, Shaftesbury Avenue, London, W.C.2.—Catalogue No. 740, giving particulars and prices of "Temco" electric lighting accessories, and catalogue No. 4007 of "Agro" electric bells, bell transformers, indicators, bell pushes, &c. These are enclosed in a strong folder with pockets on each side.

Berry's Electric, Ltd., 85-86, Newman Street, London, W.1.—A folder containing particulars and illustrations of the new season's radiators.

Hotpoint Electric Appliance Co., Ltd., 24, Newman Street, London, W.1.—Price variation sheet No. 3 dated August 19th cancelling sheet No. 2 issued on May 1st. Also an illustrated folder drawing attention to the "Hotpoint" Model 100 cylinder vacuum cleaner.

INFORMATION DEPARTMENT

GENERAL inquiries from readers relating to sources of electrical goods, makers' addresses, &c., are replied to by our Information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.

Our extensive records enable us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the following:—

WEATHERTEX cable, D.L.S. girder brackets.

AUSTRALIAN ELECTRICAL TRADE

Imports, Exports and Production

AUSTRALIAN imports of electrical machinery and appliances were £5,044,000 in value in 1938-39, against £4,916,000 in 1937-38. From the appended table, which is based on the recently issued annual statement for 1938-39 of the overseas trade of the Commonwealth, it will be seen that declines in the important trade in wires and cables and a number of minor items were partly compensated for by advances in certain power plant and telephone material. It may, however, be recalled that 1937-38 was an active year in the trade in cables. There was, it will be observed, little change in the chief countries of supply.

The recently issued report by the Statistician of the Australian Government regarding manufacturing production during the financial year 1938-39 gives more detail on the subject of electrical goods manufactured than has hitherto been available.

From the following list of equipment produced, which is taken from the report, it will be seen that great progress has been made by the Commonwealth in this branch of activity :—

	No.	£A.
Dynamos :		
Alternators...	72	4,517
Generators	455	13,092
Motors :		
Alternating current ...	31,332	319,104
Direct current	304	33,686
Transformers and convertors :		
Above 20 KVA :		
For use in supplying industrial power and light	1,712	341,773
For other industrial use	165	9,345
Below 20 KVA :		
For use in neon signs ...	13,228	28,428
For use in radio and electrical toys	23,264	9,330
For industrial use other than the supply of power and light ...	9,779	42,862
Electric batteries :		
Dry		525,000
Wet	12,164	41,539
Accumulators (automobile, radio)	475,033	615,011
Bulbs and small tubes for electric light ...		206,000
Apparatus for telegraphy and telephony ...		60,841
Apparatus for regulating, starting and controlling		536,548
Household fittings		242,081
Portable tools and appliances		1,950
Small household electro-mechanical appliances (not exceeding 33 lb.)		48,119
Other appliances and apparatus :		
Electrical appliances for motor vehicles, cycles and explosion motors		37,388
Electric stoves, ranges and cookers ...		153,000
Other domestic cooking apparatus ...		119,412
Electric heating apparatus		192,518
Other (neon signs, etc.)		466,818
Other articles produced		3,270,128

The final heading "Other articles produced" includes wireless equipment for ocean-going vessels, aircraft beacons, and short-wave receiving sets.

In 1938-39 Australian exports of electrical machinery and appliances were valued at £312,560, of which £213,900 represented produce of the Commonwealth. In 1937-38 the total value was £372,100, of which £292,000 represented Australian products. In addition, "electrical materials" of Commonwealth manufacture to the value of £61,900 were exported in 1938-39. The principal markets for these goods were New Zealand, the Pacific Islands and Malaya.

	1938-39 £	Inc. or dec. on 1937-38 £
Dry cells—		
Total	4,200	+ 400
From United Kingdom ...	2,900	— 480
„ United States ...	1,200	— 20
Nickel alkaline batteries—*		
Total	12,100	+ 1,600
Storage batteries for motor vehicles—		
Total	3,500	— 2,400
From United Kingdom ...	2,700	+ 20
„ United States ...	800	— 2,230
Other batteries and parts—		
Total	18,300	+ 5,100
From United Kingdom ...	3,600	+ 2,100
„ United States ...	14,100	+ 2,500
Cables and wire (cotton covered)		
Total†	5,700	— 1,800
Cable, telegraph and telephone, paper-insulated, lead-covered		
Total	9,400	— 13,100
From United Kingdom ...	7,200	— 8,400
„ Germany	1,100	— 5,700
Other telegraph and telephone cable—		
Total	73,500	— 16,500
From United Kingdom ...	46,500	+ 5,700
„ Germany	25,900	— 22,900
Light and power cable, paper-insulated, lead-covered—		
Total†	166,000	— 42,000
Other cable and wire for light and power—		
Total	848,000	— 109,000
From United Kingdom ...	779,000	— 121,000
„ United States ...	5,000	+ 1,700
„ Germany	31,400	+ 11,400
„ Canada	2,900	— 900
„ Japan	2,000	— 5,800
Other covered cable and wire—		
Total	140,000	— 13,000
From United Kingdom ...	111,000	— 1,000
„ Germany	10,000	— 3,000
„ United States ...	5,000	— 6,800
Carbon manufactures—		
Total	84,700	— 12,300
From United Kingdom ...	23,000	— 3,900
„ United States ...	16,200	— 200
„ Germany	9,000	— 10,800
„ Japan	1,000	— 600
Motors under 1 HP (separate)—		
Total	172,000	— 17,000
From United Kingdom ...	87,000	+ 4,000
„ United States ...	25,900	+ 7,900
„ Germany	3,800	— 2,000
H.v. induction coils—		
Total	6,400	— 2,200
From United Kingdom ...	1,300	— 100
„ Canada	2,200	— 700
„ United States ...	2,800	— 1,500
Electric fans, office or house—		
Total	26,500	+ 9,700
From United Kingdom ...	10,500	+ 1,300
„ Italy	6,800	—
„ United States ...	8,800	+ 8,500
Other electric fans—		
Total	9,000	—
From United Kingdom ...	4,700	— 2,600
„ United States ...	3,100	— 2,000
Circuit-breakers or switch units above 15 kV.—		
Total†	231,000	+ 53,000
Reactors, voltage regulators, etc.		
Total	39,000	+ 6,000
From United Kingdom ...	27,000	+ 2,000
„ United States ...	6,900	+ 5,700

	1938-39 £	Inc. or dec. on 1937-38 £
Lightning arrestors other than radio—		
Total*	15,700	— 3,400
Liquid slip regulators, thrustors, etc.—		
Total	26,400	+ 7,700
From United Kingdom ...	11,000	+ 700
„ Switzerland	9,400	+ 8,000
Generators, AC induction—		
Total	154,000	— 31,000
From United Kingdom ...	118,000	— 30,000
„ United States ...	6,500	+ 300
„ Sweden	15,200	— 3,200
Generators, AC variable speed commutator type—		
Total	11,000	— 500
From United Kingdom ...	7,100	+ 2,300
„ Sweden	2,100	+ 1,600
Other AC generators—		
Total	114,000	+ 37,800
From United Kingdom ...	91,900	+ 24,600
„ Germany	600	— 1,100
DC traction motors—		
Total†	7,800	+ 4,700
Motors for gearless lifts—		
Total	7,000	— 12,600
From United Kingdom ...	1,500	— 10,500
„ Canada	5,400	— 1,600
Other DC dynamo-electric machines—		
Total	219,000	— 8,000
From United Kingdom ...	166,000	+ 5,000
„ Germany	19,000	— 5,400
„ United States ...	20,000	— 7,000
Alternators for turbines—		
Total	70,500	— 200
From United Kingdom ...	48,000	— 16,000
„ Switzerland	19,300	+ 16,800
Universal current machines—		
Total†	3,100	— 5,600
Convertors, motor and rotary—		
Total†	19,900	+ 14,300
Lamps, filament, automobile—		
Total	43,400	— 24,800
From United Kingdom ...	22,000	— 3,200
„ Holland	14,300	— 17,300
Lamps, under 20 V, including torch and flashlight—		
Total	27,600	— 6,900
From United Kingdom ...	13,300	— 4,600
„ Japan	1,400	— 700
„ Holland	8,500	+ 1,800
Relays, switches, fuses, cut-outs, etc.—		
Total	144,000	— 5,000
From United Kingdom ...	98,000	+ 6,000
„ United States ...	28,000	— 2,000
Lamps, 20 V and over, gas-filled—		
Total	70,800	— 15,800
From United Kingdom ...	65,000	— 14,300
„ Holland	2,500	+ 100
Other lamps, 20 V and over—		
Total	20,400	— 11,800
From United Kingdom ...	15,500	— 8,500
„ Japan	2,000	— 1,100
Electric torches and torch cases—		
Total	25,000	*
From United Kingdom ...	4,000	*
„ Hong Kong	10,000	*
United States ...	5,000	*
Heating and cooking appliances—		
Total	133,000	+ 54,000
From United Kingdom ...	90,000	+ 40,000
„ United States ...	9,000	+ 4,800
„ Canada	26,000	+ 6,000

	1938-39 £	Inc. or dec. on 1937-38 £
Measuring and recording instruments—		
Total	155,000	+ 26,000
From United Kingdom ...	75,000	+ 1,000
„ Switzerland	30,000	+ 17,100
„ Germany	12,200	+ 3,800
„ United States ...	26,600	— 2,700
Regulating and controlling apparatus—		
Total	144,300	— 10,800
From United Kingdom ...	113,000	— 8,800
„ United States ...	23,500	— 2,100
Rectifiers—		
Total	33,900	+ 3,800
From United Kingdom ...	21,500	— 2,300
„ Switzerland	3,000	+ 3,000
„ United States ...	7,700	+ 3,400
Static transformers under 66,000 V—		
Total†	28,800	+ 8,300
Static transformers, 66,000 V—		
Total, mainly from Switzerland)	25,000	+ 19,000
Static transformers over 66,000 V—		
Total	18,500	— 5,900
From United Kingdom ...	13,700	+ 3,000
„ Switzerland	4,600	— 5,800
Telegraph instruments and appliances—		
Total†	19,000	+ 12,100
Telephones—		
Total†	99,000	+ 47,300
Telephone switchboards and appliances—		
Total	943,000	+ 111,000
From United Kingdom ...	779,000	+ 51,000
„ United States ...	146,010	+ 63,000
Electric vacuum tubes—		
Total	7,800	— 1,100
From United Kingdom ...	1,100	— 800
„ Holland	1,300	+ 900
„ United States ...	4,500	— 1,100
Radio tubes—		
Total	140,000	— 19,000
From United Kingdom ...	74,000	+ 7,000
„ Holland	18,000	— 15,200
„ United States ...	47,000	— 2,200
Radio parts—		
Total	85,500	— 7,900
From United Kingdom ...	37,100	— 3,000
„ United States ...	29,300	— 2,900
Battery eliminators—		
Total	800	— 2,200
Radio receiving sets—		
Total	23,100	+ 2,500
From United Kingdom ...	9,800	+ 8,200
„ United States ...	2,500	+ 500
Electrical appliances, n.e.i.—		
Total	156,500	— 55,500
From United Kingdom ...	103,000	— 23,000
„ Canada	1,100	— 600
„ Germany	7,600	— 7,800
„ United States ...	36,600	— 21,200
„ Japan	1,100	— 1,300
Electrical ware of earthenware—including insulators—		
Total	48,500	+ 18,700
From United Kingdom ...	8,000	— 2,200
„ Germany	5,400	— 1,600
„ Japan	3,300	— 800
Electrical insulating paper and boards—		
Total	31,500	— 30,300
From United Kingdom ...	23,000	— 28,600
„ United States ...	5,500	+ 1,400

* Mainly from United States.
† Mainly from United Kingdom.
‡ Comparative figures not available.

ELECTRICITY SUPPLY

Street Lighting Schemes. Year's Results at Glasgow. Electricity in A.R.P. Shelters

Aberdeen. — CHARGES UNALTERED.—Although the profits of the Electricity Department have fallen by £13,886 to £814, charges are to remain unchanged. The annual report of Mr. Alex Gardner, city electrical engineer, submitted to the Electricity Committee, states that the increase of 1,700,000 kWh in sales was entirely due to increased consumption in the pre-war period. Revenue for the year was £313,343 and working expenses £194,320, the gross profit being down by £12,635.

Bexley. — SUBSTATION EXTENSION INAUGURATED.—The official inauguration of an extension of the electricity undertaking's central substation was performed recently by Alderman J. T. H. Ashmore, chairman of the Electricity Committee, who stated that the extension was necessitated by the large increase in the demand for electricity in the borough during recent years; last winter the load carried by the undertaking being seventeen times as much as it was in 1925. The cost of the scheme was £36,000, £9,000 less than it would have been if the contracts had been placed after the outbreak of war. Although some of the load had been lost on account of the cessation of shop and street lighting, the extension of the substation was still necessary, and the growth of the undertaking was all the more amazing in view of the fact that Bexley had no industrial plant.

Dartford.—BULK SUPPLY SAVING.—The bulk supply agreement with the West Kent Electric Co., Ltd., has been varied in regard to the coal clause, and the Electricity Committee states that the effect is a reduction in the bulk supply account for the year ending March 31st, 1941, with coal at 29s. 2d. per ton, estimated at £4,125.

Gateshead.—MODIFIED STREET LIGHTING WANTED.—A conference of local authorities convened by the Mayor of Gateshead (Ald. P. S. Hancock) decided on August 23rd to press the Government to sanction the introduction of modified street lighting on Tyneside provided it was not visible from the air. In the House of Commons recently Sir John Anderson said it was not possible to have lighting in Newcastle-on-Tyne owing to its proximity to the coast.

Glasgow.—YEAR'S WORKING.—The Corporation Electricity Department reports a gross revenue last year amounting to £1,611,769 and a working expenditure of £1,125,344. Statutory charges, &c., totalled £358,312, leaving a surplus of £128,113. Of this, capital outlay met out of revenue absorbs £63,657, leaving a net surplus of £64,456. The appropriation of surplus revenue account now shows a balance of £379,082, which represents 3.1 per cent. of the gross capital expenditure. The sales of electricity reached a record total of 518,509,950 kWh, an increase of 14,554,930 kWh, or 2.89 per cent. The supply demand for new services during the year was 39,000 kW, while additional consumers connected to the mains totalled 6,891, bringing the total to date up to 209,879. Energy generated at Dalmarnock station during the year amounted to 630,812,000 kWh, and the export to the grid was 71,775,575 kWh. A sum of £341,463 has been expended on capital account during the year. Of this amount £277,806 has been incurred on additions and extensions to high-voltage mains, low-voltage services and substation plant, and has been met out of loan capital, while the balance of £63,657 has been met out of this year's surplus.

Energy purchased during the year was as follows:—Central Electricity Board, 531,857,725 kWh; Corporation Cleansing Department, 26,201,444 kWh; Strathclyde Electricity Supply Co., Ltd., 4,128 kWh; total, 558,063,297 kWh., representing an increase of 13,839,044 kWh.

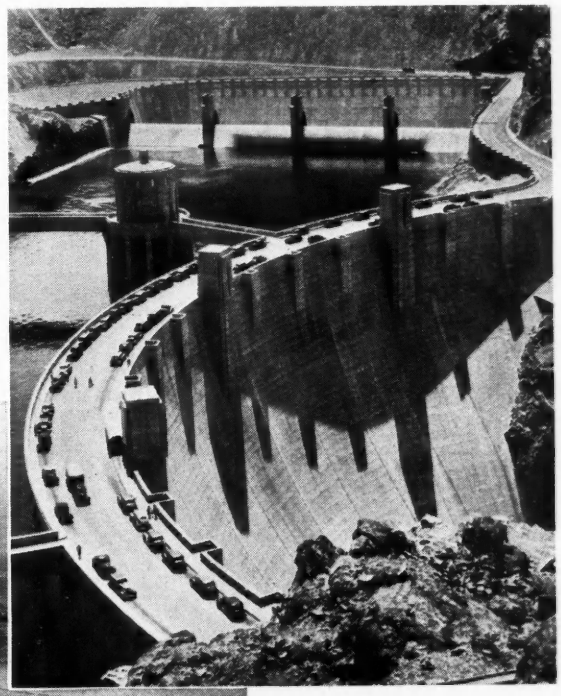
Comparative figures of the cost of production per kWh sold are:—

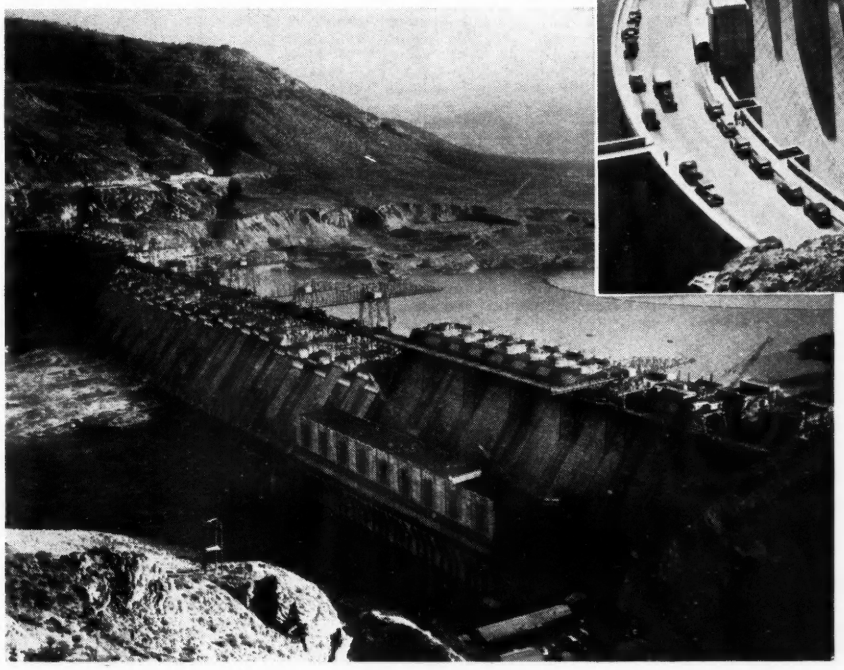
	During year	Previous year
Current purchased ...	0.364d.	0.359d.
Distribution	0.058d.	0.066d.
Management	0.065d.	0.060d.
Rents, rates, taxes ...	0.039d.	0.39d.
Loan charges	0.161d.	0.161d.
Total	0.687d.	0.685d.

Guildford.—INCREASED CHARGES.—The Corporation Electricity Committee recommends increases in various tariffs, including the flat lighting rate from 4d. to 4½d. per kWh for the first 500 kWh per quarter and from 2½d. to 2¾d. above.

Lincoln.—STREET LIGHTING.—Work has been commenced on a scheme for extending the low-intensity lighting in the main thoroughfares of the city.

London. — BATTERSEA.—The Borough Council Electricity Committee has obtained sanction to borrow £9,200 for electricity plant and is seeking sanction to borrow £5,000 for mains and services. Low intensity lighting is to be provided in further streets at a cost of £366.





America's largest power schemes. Above is an unusual view of the Boulder Dam, the top of which is used as a four-lane highway. On the left is the Grand Coulee Dam across the Columbia River—with the powerhouse in the foreground—construction of which was started in 1933 and has now been almost completed; altogether over 10 million cu. yd. of concrete has been poured

Manchester.—ALUMINIUM FOR AIRCRAFT PRODUCTION.—It has been decided that the aluminium obtained from 2,600 yd. of aluminium - conductor underground cable laid during the last war, when there was a shortage of copper, shall be presented to the Ministry of Aircraft Production. Altogether eight tons of high-grade aluminium has been recovered in this way.

Paisley.—STREET LIGHTING.—Following experiments carried out last winter, the Corporation is to have a scheme of street lighting. The main streets of the town have been fitted with lamps, and orders have been placed for a sufficient number of lamps to carry the scheme through the side streets. When these are forward practically the whole town will be served.

Portland.—SERIOUS EFFECT OF EVACUATION.—In view of reports by the electrical engineer and gas manager on the very serious position arising through consumers leaving the area, the Urban District Council has decided that consumers leaving their premises shall be called upon to honour agreements for the hire of domestic apparatus.

Preston.—POWER STATION EXTENSIONS.—The Town Council is applying to the

Electricity Commissioners for sanction to borrow £817,000 for extensions to the Ribble power station. The estimate last November was £701,453, the increase being due mainly to increased labour and material costs.

St. Helens.—ELECTRICITY IN A.R.P. SHELTERS.—The Electricity Department has issued a warning about the use of electric lighting and small electric fires in air-raid shelters. It is pointed out that electric lighting installations in public shelters are arranged on a safe low-voltage system to obviate possible danger, but in homes a much higher voltage is used. The conditions of dampness, etc., that prevail there as a rule require more than ordinary care being observed when using electrical appliances, and the public is advised not to accept any work that has not been examined and passed by the Electricity Department.

Southend-on-Sea.—REQUEST FOR MAXIMUM-DEMAND CHARGE CONCESSION.—Owing to the extensive use made of electricity during the cold weather at the beginning of the year the maximum demand upon the Central Electricity Board for bulk supply rose to 15,450 kW. Since then a large number of consumers have left the district, and the Department cannot make use of the demand during the remainder of the year. The borough electrical engineer has therefore asked the Board whether, in view of the exceptional conditions, it will make some concession in the amount payable, and it was reported to a recent meeting of the Electricity Committee that arrangements had been made for the chairman and the engineer to discuss the matter with representatives of the Board.

Overseas

Brazil. — ELECTRICAL PROGRESS. — The Brazilian Traction, Light and Power Co., Ltd., which through its affiliated concerns, controls the electricity undertakings in the Brazilian cities of Rio de Janeiro and San Paulo, states in its recently-issued report for 1939 that the total sales amounted to 1,555.2 million kWh as compared with 1,462.6 million kWh in 1938, an advance of about 6.3 per cent. During the year the connected load on the generating stations increased from 1,047,456 kW to 1,121,011 kW, and the number of consumers from 500,551 to 532,003. The length of the distribution lines was extended during the year from 26,319 to 27,786 miles.

Although the capacity of the generating plants remains unchanged at 524,484 kW, the report states that in connection with new developments constructional work on the Serra hydro-electric plant extension near San Paulo is continuing actively and that the modernisation of the two turbines first installed is approaching completion. In connection with the work of modernisation of the Lages power plant and in order to provide for the increase in the demand for power supply in Rio de Janeiro a new 48,000-HP turbine has recently been put into service. During the past year the connected transformer capacity was increased to the extent of 106,905 kVA, bringing the total up to 1,453,908 kVA.

Canada.—BEAUHARNOIS DEVELOPMENT.—Work is well under way near Valleyfield, Quebec, in connection with the Beauharnois development expansion. About 100 men are engaged in preliminary work in connection with the $1,000,000 contract awarded to the Foundation Company of Canada for erection of dams between St. Timothee and Cedars, to raise the water level for the Beauharnois plant.—*Electrical World.*

China. — ELECTRICITY IN SHANGHAI. — Speaking at the annual general meeting of the Central China Development Co., the chairman, Mr. Kenji Kodama, stated that the Company's subsidiary, the Central China Electric Light, Power and Water Supply Co. had recently reported a monthly output of some 7,300,000 kWh in the purely business area of Shanghai, which was a twofold increase as compared with the output at the time of the Company's organisation. Although the Company was experiencing no little difficulty it had only made a temporary increase in its charges of 49 per cent. since November, 1939, whereas the American-owned Shanghai Electric Power Co. had raised its rates by 150 per cent.

Eire. — ELECTRICAL LEGISLATION.—Our Dublin correspondent reports that the text of a Bill to amend the Electricity (Supply) Acts, 1927 to 1935, has just been issued. Doubts have been expressed regarding the powers of the Electricity Supply Board to use peat for the generation of electricity, and the measure contains specific provisions permitting the construction and maintenance of power stations in which peat or other fuel may be used. It also seeks to empower the Board to utilise the water of any river, subject to the payment of reasonable compensation and the return of the water to the river. The part of the Liffey Reservoir Act which limited the advances to the Board to £6,259,000 is to be repealed, and a new maximum of £10,259,000 substituted.

Italy.—MORE TRANSMISSION LINES.—The Societa Romana de Elettricita, of Rome, has recently been authorised to erect a 60-kV transmission line between substations at Tiburtina and Tor Pignattara, near the Italian capital. A 60-kV line is also to be erected by the Societa Orobia, of Sondrio, between the central power station at Morbegno and Introbio in the province of Sondrio.

Rumania.—ELECTRICITY PRODUCTION IN 1939.—According to statistics issued by the General Association of Producers and Distributors of Electrical Power, the production of 48 electricity undertakings in Rumania in 1939, representing 80 per cent. of the total output for the country, amounted to 489.3 million kWh, against 457.0 million kWh in 1938, an increase of 4.86 per cent.

TRANSPORT

Aberdeen.—GREATER USE OF TRAMS.—At last week's meeting of the Town Council it was stated that the quantity of electricity supplied to the tramways had increased by 8.3 per cent. during the past year. This increase, the city electrical engineer pointed out, showed how the transport system, dependent on home-produced fuel, was able to take care of the position arising from restrictions on the use of imported fuel for the motor bus service.

United States.—INCREASE IN TRAFFIC.—According to *Mass Transportation*, a gratifying trend in traffic was noted in reports showing transit passengers for April compared with the same month last year. Groups in this report are according to population, and all groups show increases, which run from 1.2 per cent. to as high as 8.8 per cent., the latter being for the group of properties operating in cities of less than 50,000 population. The figures represent companies which include in the group operators of railway, trolley-bus and motor-bus vehicles. Likewise the reports for totals for the first four months of 1940 show increases in every instance, the figures running from 0.7 per cent. to 10.7 per cent., properties in cities from 50,000 to 100,000 population showing the maximum increase in this instance. The fact that increases are shown in every group indicates that city traffic and therefore city business in general is showing a consistent rise. Prospects seem bright for a continuation of this trend. Most mass transportation companies have maintained their equipment situation so as to be in a position to handle greatly increased traffic in an emergency, but some are still handicapped by having little or no new equipment to meet even present traffic requirements economically. Such companies are, however, showing increasing tendencies to modernise their equipment.

RADIO AND TELEPHONY

Canada. — NEW SHORT-WAVE RADIO STATION.—It is reported that the Canadian Senate War Co-operation Committee proposes to build a 50-kW short-wave radio station as an aid to Empire co-operation.

Eire.—WIND POWER FOR RADIO.—The Department of Posts and Telegraphs recently placed a contract for eleven "Wincharger" generating plants for use in maintaining the radio-telephone and telegraph services between the mainland and the islands off the south-west, west and north-west coasts, and delivery of the equipment has now been completed.

Singapore.—NEW BROADCASTING STATION.—It is announced that the Government has decided to erect a 100-kW transmitter at Singapore to make possible the dissemination of British news and views over a wide area in the Far East. In view of the British Government's keen interest in this scheme, it is stated, part of the cost of the new station will be met from funds in the United Kingdom.—*Reuter.*

Switzerland.—SWISS-FRENCH TELEPHONE SERVICE RESTORED.—According to *Reuter*, it was announced on the Swiss Radio last week that the telephone services between Switzerland and unoccupied France were to be restored on Thursday, August 22nd.

Municipal Supply Undertakings' Results

Town	Engineer or Manager	Total Revenue 1938/9	Total Revenue 1939/40	Working Expenses 1938/9	Working Expenses 1939/40	Net Profit or *Loss* 1938/9	Net Profit or *Loss* 1939/40	Sales of Electricity in Distribution Area 1938/9	Sales of Electricity in Distribution Area 1939/40	Percentage Increase
		£	£	£	£	£	£	Thousands of kWh.		
Bath	J. W. Spark	228,463	267,201	179,805	194,575	10,263	27,011	33,218	38,750*	16.6
Cannock	P. Wardle	77,116	82,344	54,050	52,311	5,444	6,182	15,486	17,323	11.9
Eastbourne	N. Boydell	242,014	229,942	184,852	169,511	3,175	5,878	38,271	38,003	*0.7 decrease*
Hastings	A. J. Ryan	270,549	257,183	196,957	195,716	4,543	*9,012*	41,249	41,407*	0.4
I.O.M. Board	V. A. F. Bellamy	33,015	35,422	20,006	23,063	1,925	*545*	3,396	3,775	11.1
Ipswich	G. A. Vowles	313,706	321,081	228,489	248,671	31,385	15,846	54,021	57,252*	6.0
Maidstone	E. E. Hoadley	185,130	191,181	116,198	121,362	10,720	9,779	41,601	44,577	7.1
Mansfield	A. Latham	76,583	80,357	52,514	59,183	4,225	1,338	10,241	11,898	16.2
Nottingham	G. H. Lake	851,753	847,879	523,999	556,947	40,130	1,804	161,365	170,183	5.5
Scarborough	W. K. Fleming	157,452	159,697	105,735	100,886	2,237	7,767	18,338	18,217*	*0.7 decrease*
Sheffield	J. R. Struthers	1,497,360	1,600,077	928,353	1,043,972	131,557	106,468	551,988	629,953	14.1
Stretford and District	T. A. Kerr	500,369	534,440	380,437	433,647	22,541	*5.426*	173,767	198,706	14.4
Sunderland	W. A. Royle	273,107	287,272	185,202	210,111	33,970	23,721	67,334	72,597	7.8
Tunbridge Wells	R. N. Torpy	165,003	178,880	124,081	137,153	2,971	4,551	42,880	[46,188	7.7
West Ham	J. W. J. Townley	688,656	672,871	502,800	523,041	62,882	24,620	161,816	155,843*	*3.7 decrease*
Weymouth	G. Nicolson	83,107	92,086	61,149	75,384	2,408	2,174	13,965	16,232*	16.2

* Excluding bulk supplies as follows (1938–39 and 1939–40, respectively) in thousand kWh:—Bath: 33,093; 41,528. Hastings: 12,117; 12,752. Ipswich 7,999; 8,876. Scarborough: 813; 1,055. West Ham: 2,108; 1,129. Weymouth: 1,945; 2,163. Also small amounts in the cases of Eastbourne, Sheffield, Stretford and Sunderland.

NEW PATENTS

Electrical Specifications Recently Published

Compiled by a firm of chartered patent agents. The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (1s. each) can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1938

31225. "Illuminating devices and attachments therefor." Stam-O-Lite, Inc. November 11th, 1937. (Cognate application 31226/38.) (524200.)

34001. "Electrical coupling devices." Tovarna Na Kable Akciova Spolecnost, and K. Konstantinowsky. November 22nd, 1938. (524140.)

34354. "Selection-controlling apparatus for telephone systems." Standard Telephones & Cables, Ltd. November 26th, 1937. (524141.)

1939

1327. "Manually operated electric switches, particularly for the remote-control of electric motors." J. Stone & Co. and E. C. Hatcher. January 14th, 1939. (524144.)

2111. "Eddy-current dynamometers." Heenan & Froude, Ltd., and E. G. Ross. January 21st, 1939. (524080.)

2115. "Driving devices for electrically propelled vehicles." F. Whyman, and Metropolitan-Vickers Electrical Co., Ltd. January 21st, 1939. (524083.)

2143. "Electrostatic voltmeter." R. Schroeder. January 22nd, 1938. (524089.)

2175. "Push-button volume control device for radio receiving sets." Philco Radio & Television Corporation. January 25th, 1938. (524094.)

2176. "Amplitude and phase adjusting networks for alternating current." Marconi's Wireless Telegraph Co., Ltd., A. W. Lay and M. D. Tooley. January 21st, 1939. (524095.)

2240. Electromagnetically operated device for the rhythmic control of electric circuits." H. B. Lyle. January 23rd, 1939. (524110.)

2242. "Screening of internal-combustion engine ignition systems for prevention of radio interference." J. Marr. January 23rd, 1939. (524111.)

2278. "Winding machines for winding together in a roll ribbons of metallic foil separated by ribbons of insulating material." T. C. Deutschmann. October 14th, 1938. (524120.)

2298. "Process and apparatus for making base assemblies for sealed glass envelopes." Corning Glass Works. February 28th, 1938. 524127.)

2305. "Electrical detonation indicator for internal-combustion engines." Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. February 2nd, 1938. (524130.)

2349. "Enamelled wire." Naamlooze Vennootschap Pope's Metalldraadlampenfabriek. January 25th, 1938. (524166.)

2351. "Mounting arrangements for piezo-electric crystals." Automatic Telephone & Electric Co., Ltd., and T. B. D. Terroni. January 23rd, 1939. (524167.)

2354. "Circuits for electric-discharge devices." Bendix Aviation Corporation. January 31st, 1938. (524169.)

2415. "Vehicle lamps." C. R. Blandford. January 24th, 1939. (524206.)

2419. "Manufacture of electric-discharge devices." General Electric Co., Ltd., and J. R. Burges. January 24th, 1939. (524183.)

2447. "Electric motor control systems." British Thomson-Houston Co., Ltd. January 24th, 1938. (524212.)

2462. "Prepayment mechanism for electricity meters and the like." Switchgear & Meters, Ltd., and A. W. Angold. January 24th, 1939. (524219.)

2478. "Railway signal and/or points control systems." Standard Telephones & Cables, Ltd., A. Brown and L. J. Godfrey. January 24th, 1939. (524223.)

2479. "Signal transmission systems." Standard Telephones & Cables, Ltd., K. G. Hodgson and A. H. Roche. January 24th, 1939. (524224.)

2480. "Electric oscillators. Standard Telephones & Cables, Ltd., and R. M. Barnard. January 24th, 1939. (524225.)

2483. "Supply circuits for cathode-ray tubes." Kolster-Brandes, Ltd., and D. S. B. Shannon. January 24th, 1939. (524226.)

2491. "Cathode-ray apparatus for recording in a visible form intelligence in the form of electrical signals." Scophony, Ltd., and A. H. Rosenthal. January 24th, 1939. (524230.)

2496. "Method of and means for securing electrical contact pins to thermionic valve sockets." G. David. January 24th, 1938. (524233.)

2504. "Apparatus and circuits for the control of railway track switches." General Railway Signal Co. January 29th, 1938. (524236.)

2528. "Cathodes for electron-discharge devices." W. Ehrenberg. January 25th, 1939. (Cognate application 12579/39.) (524240.)

2546. "Tuning arrangements for radio receivers." E. K. Cole, Ltd., and A. W. Martin. January 25th, 1939. (524245.)

2548. "Impulse senders of the type used in telephone systems." General Electric Co., Ltd., and C. C. Puckette. January 25th, 1939. (524262.)

2552. "Automatic control mechanism for electrically driven pumps." Drysdale & Co., Ltd., and J. Young. January 25th, 1939. (524264.)

2569. "Means for producing invisible radiation adapted to excite luminescent materials not integral with them." General Electric Co., Ltd., and G. H. Wilson. January 25th, 1939. (524268.)

2570. "Dielectric compositions." Dussek Bros. & Co., Ltd., and A. W. Thompson. January 25th, 1939. (Cognate application 2646/39.) (524246.)

2580. "Electrolytic polishing of metals, particularly steel." Brevets Aero-Mécaniques Soc. Anon. February 10th, 1938. (524272.)

2645. "Magnetic cores for transformers and like magnetic induction apparatus." British Thomson-Houston Co., Ltd. January 25th, 1938. (524285.)

2649. "Television and like systems." W. Jones & Pye, Ltd. January 25th, 1939. (524286.)

2715. "Electric wave amplifying systems." J. Lawton. January 26th, 1939. (524298.)

2738. "Photo-electric door-controlling apparatus and the like." British Thermostat Co., Ltd. January 26th, 1938. (524303.)

2747. "Electric hot-plates." British Thomson-Houston Co., Ltd. January 28th, 1938. (524306.)

2798. "Thermionic valve oscillators and amplifiers." E. R. Wigan. January 27th, 1939. (524314.)

2860. "Control of the supply of electric power to an electrical load." Westinghouse Electric International Co. January 28th, 1938. (524329.)

2879. "Luminaires." Holophane, Ltd. (T. W. Rolph). January 27th, 1939. (524334.)

2891. "Method of sealing glass with ceramic material." C. Lorenz Akt. Ges. January 27th, 1938. (524339.)

2892. "Thermionic valve and like wave amplifying systems." Standard Telephones & Cables, Ltd. March 29th. 1938. (524340.)

2893. "Routine test equipment for electrical circuits." Standard Telephones & Cables, Ltd., E. P. G. Wright and G. E. Peters. January 27th, 1939. (524341.)

2895. "Printing-telegraph apparatus." Creed & Co., Ltd. March 3rd, 1938. (Cognate applications 2896/39 and 2897/39.) (524342.)

2939. "Means for dressing electrodes of spot-welding machines." A. C. Basebe and Hydraulic Coupling & Engineering Co., Ltd. January 27th, 1939. (524348.)

2948. "Water - heating apparatus." Simplex Electric Co., Ltd., P. W. Davies and J. Kirby. January 27th, 1939. (524351.)

2963. "Line fuses." V. Hope. January 28th, 1939. (524353.)

2972. "Manufacture of metal mesh electrodes for use in cathode-ray tubes." H. E. Holman. January 28th, 1939. (524354.)

2977. "Control systems for railway track switches and signals." General Railway Signal Co. January 29th, 1938. (524357.)

2987. "Automatic tuning control arrangements." Marconi's Wireless Telegraph Co., Ltd., and V. J. Cooper. January 28th, 1939. (524359.)

2988. "Directional aerials and aerial systems." Marconi's Wireless Telegraph Co., Ltd., and O. Bohm. January 28th. 1939. (524360.)

2989. "Radiogoniometers." Marconi's Wireless Telegraph Co., Ltd., and C. S. Cockerell. January 28th, 1939. (524361.)

3000. "Electrical storage equipment, such as that used in tele-communication exchange systems." Standard Telephones & Cables, Ltd., E. P. G. Wright and G. E. Peters. January 28th, 1939. (524364.)

14370. "Radio receivers with pre-set tuning." Philips Lamps, Ltd. May 16th, 1938. (524373.)

16785. "Devices for facilitating the supervision or checking of the pressure in oil-filled electric cables." Soc. Italiana Pirelli. June 13th, 1938. (524375.)

17894. "Impulse voltage installations." Philips Lamps, Ltd. June 22nd, 1938. (524192.)

18142. "Radio receivers comprising means for suppressing aperiodic disturbances." Philips Lamps, Ltd. June 24th, 1938. (524193.)

21151. "Ganged condenser systems." Philips Lamps, Ltd. July 23rd, 1938. (524194.)

21375. "Ganged condenser." Philips Lamps, Ltd. July 25th, 1938. (524195.)

Limitation of Supplies

THE Electrical Wholesalers' Federation has secured further rulings upon the application of the Limitation of Supplies Order to electrical appliances which considerably clarify the position. Lists of goods included in Classes 9, 14 and 17 of Schedule 5 of the Order were given in our issues of August 16th and 23rd but they are repeated for readers' convenience :—

Class 9.—Egg boilers, hair clippers (domestic and animal), milk heaters or porringers, coffee percolators, saucepans, shavers, shaving pots, domestic-type steamers, teapots.

Class 14.—Gas lighters operated by dry batteries, cigar lighters.

Class 17.—Chafing dishes, dish washers, hair dryers, irons, kettles, domestic toasters, vacuum cleaners, warming plates, washing machines.

None of the following articles is at present controlled, although washing machines, including those of which ironing machines are an integral part, are controlled :—

Domestic boiling plates and rings, bronchitis kettles, breakfast cookers, clocks, cookers, curling tong heaters, curling and waving irons and heaters, drying cabinets, fires and radiators, floor polishers, fruit juice extractors, geysers, grill boilers, domestic grillers, hand dryers, health exercisers, domestic hot-cupboards, portable hot-plates, immersion heaters, ironing machines (unless included as an integral part of a washing machine), motor-driven kitchen appliances, mixers (drink and domestic), motor car heaters, sewing machine motors, soldering irons, sterilisers, towel rails and heaters, tubular heaters, urns (up to and including 6 gall. capacity), vibrators, waffle plates, warming bottles, pads and blankets, wash-boilers, water heaters (up to 50 gall. capacity).

A ruling as to the position of elements or replacement parts has not yet been received, although it seems reasonable to suggest that replacements would fall within the class to which the apparatus belongs.

FINANCIAL SECTION

New Companies. Capital Returns. Debenture Charges. Bankruptcies and Liquidations. Reports and Dividends. Stocks and Shares

New Company Registered

Telephone Rentals (Stores Distribution), Ltd.—Private company. Registered August 21st. Nominal capital of £100. Objects: To carry on the business of making, selling, hiring, renting and maintaining electric clocks, time recorders, private telephones and telegraphs and electrical apparatus of all kinds, &c. Subscribers: Wm. S. Philcox and F. T. Jackson, both of Hollingsworth Works, West Dulwich, S.E.21. Secretary: G. H. Field.

Companies' Returns

Statements of Capital

North-Eastern Electric Supply Co., Ltd.—Capital, £8,760,000 in 1,500,000 7 per cent. cumulative preference 2,500,000 5 per cent. preference, and 4,760,000 ordinary shares of £1. Return dated April 3rd, 1940. £1,500,000 7 per cent. preference, £1,609,640 5 per cent. preference, and £4,759,919 ordinary stock taken up. £6,806,700 paid. £1,062,859 considered as paid. Mortgages and charges at date of return: £5,886,092 (£84,469 since paid off). The issued capital was converted into stock on June 16th, 1936.

Notting Hill Electric Lighting Co., Ltd.—Capital, £450,000 in 250,000 ordinary shares of £1 and 20,000 preference shares of £10. Return dated March 5th, 1940. 135,250 ordinary and 20,000 preference shares taken up. £201,352 10s. paid (1s. on 27,050 ordinary and £10 on 20,000 preference shares), £133,897 10s. considered as paid (£1 on 108,200 ordinary and 19s. on 27,050 ordinary shares). Mortgages and charges: £134,050.

Ringwood Electric Supply Co., Ltd.—Capital, £50,000 in £1 shares. Return dated March 20th, 1940 (filed May 7th, 1940). All shares taken up. £50,000 paid. Mortgages and charges nil.

Trent Valley and High Peak Electricity Co., Ltd.—Capital, £200,000 in £1 shares. Return dated March 20th (filed May 7th), 1940. All shares taken up. £210,666 13s. 4d. paid (including 2s. 8d. per share premium). Mortgages and charges nil.

Park Royal Engineering Co., Ltd.—Capital, £50,000 in £1 shares. Return dated March 26th, 1940. 37,605 shares taken up. £36,605 paid. £1,000 considered as paid. Mortgages and charges nil.

Windermere and District Electricity Supply Co., Ltd.—Capital £75,000 in 5,000 cumulative preference, 5,000 preference and 5,000 ordinary shares of £5. Return dated April 9, 1940. 5,000 cumulative preference, 4,000 preference and 4,340 ordinary shares taken up. £23,850 paid on 3,040 cumulative preference and 1,730 ordinary shares. £42,850 considered as paid on 1,960 cumulative preference, 4,000 preference and 2,610 ordinary shares. Mortgages and charges nil.

Waste Heat and Gas Electrical Generating Stations, Ltd.—Capital, £350,000 in £160,000 ordinary stock, £80,000 preference stock, and 220,000 unissued shares of 10s. Return dated April 9th, 1940. All preference and ordinary stock taken up. £160,000 paid on ordinary stock. £80,000 considered as paid on preference stock. Mortgages and charges nil.

Ericsson Telephones, Ltd. — Capital, £700,000 in £199,970 preference shares of £1 and 499,970 ordinary shares of 5s. and 1,500,150 ordinary stock units of 5s. Return dated April 17th. 199,970 preference and 1,500,150 ordinary stock units of 5s. issued and fully paid up. Mortgages and charges: £50,000.

Jarrow & District Electric Traction Co., Ltd.—Capital £60,000 in £1 shares. Return dated April 24th. 59,934 shares taken up. £49,945 paid. £9,989 considered as paid. Mortgages and charges nil.

Pirelli, Ltd.—Capital £400,000 in £1 shares. Return dated April 25th. All shares taken up. £400,000 paid. Mortgages and charges: £150,000.

Globe Electrical Co., Ltd.—Capital, £3,500 in £1 shares. Return dated May 23rd. 3,000 shares taken up. £3,000 paid. Mortgages and charges nil.

Hartland Electric Light & Power Co., Ltd.—Capital, £2,000 in £1 shares. Return dated April 15th. 1,200 shares taken up. £1,700 paid. £100 considered as paid. Mortgages and charges nil.

Machynlleth Electric Supply Co., Ltd.—Capital, £7,000 in £5 shares. Return dated April 17th. All shares taken up. £7,000 paid. Mortgages and charges: £3,238 15s. 7d.

J. G. Sneath, Ltd.—Capital, £3,000 in £1 shares. Return dated April 3rd. All shares taken up. £1,969 paid. £1,031 considered as paid. Mortgages and charges nil.

R. King & Sons, Ltd.—Capital £5,000 in £1 shares. Return dated February 1st, 1939 (filed May 6th, 1940). All shares taken up. £1,200 paid. £3,800 considered as paid. Mortgages and charges nil.

Mortgages and Charges

English Electric Co., Ltd.—Satisfaction in full on July 15th, 1940, of debenture dated June 13th, 1936, and registered June 17th, 1936, securing £350,000.

Milliwatt Heating Pad, Ltd.—Debenture charged on the company's undertaking and property, present and future, including uncalled capital, dated July 25th, 1940, to secure £300. Holder: A. V. Summers, 5, Carlton Road, Ealing, W.5.

Williams & Back, Ltd.—Debenture, charged on the company's undertaking and property, present and future, including uncalled capital, dated August 8th, 1940, to secure £500. Holder: W. E. Gallier, 21, Macaulay Road, Clapham, S.W.4.

Receiver Appointed

N. Darbyshire & Co., Ltd.—D. Shields, of 16, John Dalton Street, Manchester, was appointed receiver and manager on August 7th, 1940, under powers contained in debenture dated June 18th, 1940.

Company Liquidations

Austin Clarke, Ltd., electrical engineers, 31, Christopher Street, E.C.—Under the compulsory liquidation of this company the first meetings of creditors and shareholders were held on August 23rd at the Board of Trade Offices, Carey Street, W.C. Mr. H. P. Naunton, Official Receiver, reported that the company was formed in April, 1936, with an issued capital of £52, and dealt in clearance lines of electrical and radio goods. It was interested in a contract to supply torch batteries to the value of £10,720, and purchased two parcels for £218 and £718 respectively. The first consignment was deemed unsaleable and the cheque for the second was stopped, but the holder obtained judgment for £193 and instituted these proceedings. No statement of affairs was lodged, but the unsecured liabilities were estimated at £1,300, and a debenture had been issued to secure a cash advance of £350, whilst the assets were stated to include a stock of batteries valued at £700. A resolution was passed for Mr. A. E. Attwood, accountant, 76, Finsbury Pavement, E.C., to act as liquidator, with a committee of inspection.

Locke & Soares, Ltd., electrical engineers, 24, Coleman Street, London, E.C.—The statement of affairs of this company shows liabilities of £2,955, whilst the assets of £4,569 are absorbed in the claims of debenture holders. The Official Receiver reports that the company was formed in January, 1939, with a nominal capital of £10,000, the whole of which had been issued. The directors attribute the failure to the war, which brought the business almost to a standstill, while very few orders of national importance were obtained. As a result of meetings of creditors and shareholders held in June last the Court approved the appointment of Mr. D. A. Jacobs, of Newman Street, London, W., as liquidator of the company with a committee of inspection.

Glossop Rediffusion Service, Ltd.—Winding up voluntarily. Liquidator, Mr. F. J. Bellchambers, Bush House, Aldwych, London, W.C.2.

Bankruptcy Proceedings

A. Lewsley (West Ewell Electrical Supplies), electrical engineer, 2, The Parade, Chessington Road, West Ewell, Surrey.—Trustee, Mr. C. Latham, 185-188, High Holborn, W.C.1, released July 25th.

H. M. Wise (H. M. Wise & Sons), electrical engineer and radio dealer, Corvedale Road, Craven Arms, Salop.—Trustee, Mr. F. E. Bendall, King Edward House, New Street, Birmingham, released August 8th.

L. Cole (Netherfield Radio Stores), radio and electrical engineer, 5, Victoria Road, Netherfield, Notts.—Trustee, Mr. A. J. Rogers, 22, Regent Street, Park Row, Nottingham, Official Receiver, released August 17th.

Reports and Dividends

The Young Accumulator Co., Ltd.—Presiding at the annual meeting held on August 21st, Lt.-Col. L. P. Winby (chairman) said that the increased turnover during the year under review was by no means due solely to war production. They had purchased further shares in Associated Electric Vehicle Manufacturers, Ltd., in order to obtain the voting majority of the share capital. The manufacturing units of that company—Electricars, Ltd., and A. E. Morrison & Sons, Ltd.—in common with other vehicle manufacturing concerns, had had difficulty in obtaining regular and prompt deliveries of the necessary materials and components. The order book was now larger than ever, and it was expected that it would be possible to effect deliveries in due course, but the demands of the country for war material had necessitated a large part of Electricars' factory being devoted to war work. With regard to their own company, the output for the first four months of the present financial year was greatly in excess of that of the similar months of last year, and was, of course, increasingly made up of products for uses directly due to the war.

Thorn Electrical Industries, Ltd.—Presiding at the annual meeting on August 26th Mr. Jules Thorn (chairman and managing director), after referring to the difficulties that they had had to face owing to war conditions, said that without departing from the conservative policy which had marked their previous distributions, they were able to maintain the dividend at 20 per cent. The "Atlas" lamp side of the business had continued to make progress and their position was satisfactory. Many additional Government and other important contracts had been secured during the year. The range of "Ferguson" radio receivers which they offered during last season added further to the goodwill which they had been steadily building for these sets over past years. They recently introduced at a very popular price a small short-wave receiver which had sold in many thousands. The chief feature of all their sets was improved short-wave performance for the reception of Empire and American programmes at all hours of the day and night.

Solus Teoranta held its annual meeting in Dublin on August 17th, when Mr. J. J. Walsh (chairman), who presided, said that at the outbreak of war they had supplies of raw materials for a long period ahead, and latterly they found they could get almost all they needed from the Western Continent. Amongst new developments during the year was a new

(*Continued on page* 185.)

STOCKS AND SHARES

Tuesday Evening.

STOCK Exchange markets pursue the even tenor of their way. Thanks to the skilful manner in which the Treasury is handling the money position, gilt-edged stocks remain in favour, and the price of the three-and-half per cent. War Loan keeps over par. This has the effect of steadying the rest of the list and, of course, of inducing subscription to National War Bonds and other forms of Government borrowing. The general disposition of markets is firm, with a tendency on the part of prices to strengthen. This is reflected in our own price-lists, where the changes—what there are of them—are nearly all upwards. Front-rank industrials such as General Electric at 70s., and Tube Investments at 80s., show by the improvement in their prices the willingness of the investor to put money into what may be called gilt-edged ordinary shares.

Electricity Supply Shares

From the recent acute depression that overtook the ordinary shares of companies in the electricity supply group, it may be said that the market has practically recovered. Timid folk who parted with their shares at the time when the air warfare became intensified are not only repenting of their fears, but are paying penalty for them by coming back into the same, or similar, investments. Nor does the occasional small reduction in interim dividend by some of the supply companies check this disposition. Northmet ordinary at 28s. 9d. are ½ higher. Scottish Power, Midland Counties and Metropolitans, all similarly quoted at 28s. 9d., show rises on the week. British Power and Light ordinary have hardened to 22s. 6d., City Lights to 22s., and Edmundsons to 23s. Clyde Valleys followed up their last week's gain of a florin to 30s., by further improvement to 31s. 3d. A rise of 2s. 6d. lifted County of London to 30s. Preference shares are moving on the same lines. Quotable changes occur more rarely than in the ordinary shares, but several blocks, ranging from 3,000 to 5,000 shares, have lately changed hands. To-day's would-be buyer is likely to find, upon coming to test the market, that the available supply is very scanty. London Associated 4½ per cent. preference at 17s. 6d. and East African 7 per cent. preference at 23s. 9d. are easier on the week.

Mutual Insurance

Steady progress is being made every week in the direction of making some provision or fund, on the part of electricity supply undertakers, for mutual insurance in the event of damage to plant, &c., by hostile aircraft. As mentioned earlier this month, the argument is that, seeing the risk to be very much the same for all bodies—municipal and otherwise—connected with the supply industry, therefore the insurance against loss should, logically, be spread over a wide area. The Central Electricity Board, municipal authorities and limited liability companies are represented at the meetings which have taken place to decide the lines upon which a mutual insurance fund can be established. A number of obstacles have been surmounted, but there still remain to be settled a few questions relating to the method of contribution which the individual undertakings should make to the fund that it is proposed to set up. Some advocate that it should be governed by the output of energy; others, that it should be calculated upon the capital employed by the body, municipal or company; other suggestions are also being examined.

The point which emerges from the discussions is the fact that something is going to be done and will be put into effect before long. The central point is the foundation of a fund which can be drawn upon to compensate for losses which may be sustained by reason of enemy aircraft.

Dividends and Policy

Many companies are declaring dividends to the full extent of their earnings. Division up to the hilt is warranted, according to a large body of opinion, by the circumstances of times which admit the desirability of people having as much money as possible, not so much for spending purposes, as for investment in the National War Bonds and other British Government loans. For this reason some boards of directors, eminently cautious as a rule, are departing a little from their ordinary practice, and are declaring dividends, where these have been earned, with the intention of the cash being utilised by the shareholders for a furtherance of the common effort.

Income Tax in Advance

Another manner of dealing with a company's surplus funds, and one that is being adopted in various directions, is to utilise these for payment in advance of the full year's income tax, 1940-41, declining to take the interest which the Inland Revenue would in the ordinary way allow on such payments. Some uncertainty having arisen on a point in connection with E.P.T., the Chancellor of the Exchequer has laid it down definitely that monies not required for the purpose of a trade or business will be left out of account in computing capital for E.P.T. This removal of obscurity will free money, which in the aggregate is likely to come to a considerable sum, for the purposes of taking up National War Bonds.

Home Railway Charges

If the railway companies are given the right to increase their charges by about 7 per cent. from October 1st next, this will mean, according to the statements made by the opponents of the proposal, a definite step towards inflation. Therefore, the findings of the Railway Charges Consultative Committee—the inquiry started on Monday in this week—will probably be shaped in such a way as will be likely to remove any possibility of their leading to inflationary tendencies. The Stock Exchange market in Home Railway stocks waits upon the result of the inquiry. Southern Railway issues maintain their previous prices. London Passenger Transport stocks are unchanged.

The Confident Conviction

The financial effect of the daily air raids can be seen by referring to the prices in our lists overleaf. These show a 10 to 1 proportion of rises to falls. The psychological effect has been literally nil. There are something like 4,000 members of the Stock Exchange of whom, roughly speaking, one half are engaged in actice service at home or abroad. The remainder stand about the markets in the House day after day, some of them booking hardly a transaction, but all with an unshakable conviction of the country's victorious issue from the war.

There has been no sign, on any day, of excitement; not a ripple of apprehension. If anything, the atmosphere is one of rather bored idleness. That prices should keep up as well as they are doing at the present time is acknowledged on every hand to be a matter for some surprise. So far from the enemy tactics having any unfavourable effect, the price lists are sufficient in themselves to demonstrate that the reverse is the case, and the enemy's war of nerves is a complete failure, so far as Stock Exchange markets are concerned.

Equipment and Manufacturing

Mention has already been made of the improvements in Tube Investments and General Electric shares. Johnson & Phillips have risen ½ to £2; Joseph Lucas a similar fraction to 50s. English Electrics, too, are 2s. 6d. up, at 25s. S. Smith 1s. deferred shares at 5s. are ⅛ to the good. Pye deferred have advanced to 8s. 9d. Further improvement has lifted Ever Ready shares to 24s. Electric and Musical Industries are a little better at 6s. 6d. There are 500 Walsall Conduits 4s. ordinary shares on offer at 23s. 6d. which, at the previously paid dividend of 55 per cent., give a return of £9 7s. per cent. on the money.

Most of the movements in preference shares are upward, but, exceptionally, Ferranti 7 per cent. preferences have come on offer and at 23s. 3d. show a loss of 1s. 9d. There is a small amount of Drake & Gorman 5½ per cent. redeemable debenture stock on offer at 100, May and November interest. To meet the annual interest charge £2,366 is required, and the amount available in the last-published profits was £4,190. It may be of service to mention, also, that £2,000 Electrical and Industrial Investment 4½ per cent. debenture stock can be bought at 103½, January and July interest. This returns £4 7s. per cent. without making allowance for possible repayment, which can be effected at any time by the company at 105. The annual interest charge of £4,500 was covered in the last-issued accounts by £43,500 profit.

The Treasury's Ban

The Government is being pressed to take steps that will permit a greater freedom of dealing than is now allowed in stock and shares of certain foreign countries. Those quoted in our own lists include American Telephone & Telegraph, Brazilian Traction, Mexican Light & Power, Shawinigan Power and a few others. Holders in this country may sell, if they wish to do so, to a non-resident. They are not allowed to deal, save under exceptional circumstances, with residents. The details and purpose of this prohibition have been set out here as they were unfolded by the Treasury. Many shares, lodged by their holders with the Bank of England, were sent to Canada by the Bank, for the sake of safety. If the Government does not intend to requisition these shares, why, the Chancellor is asked, cannot negotiable certificates of deposit be issued in order to "de-freeze" the present unsatisfactory position? Sir Kingsley Wood undertook to give the matter his close attention. While the question remains in suspense, the various securities affected by the ban are left in our lists at the officially-fixed quotations of June 17th last.

Stocks that Cannot be Sold

Another ban imposed by the Treasury upon freedom of dealing in Stock Exchange securities is that which forbids transactions to take place below fixed minimum prices in certain specified stocks. The object, as previously explained, is to prevent the possibility of national credit being weakened by jettisoning of securities in some conceivable spasm of apprehension, when the holders might be tempted to fling away their interests for any money the latter would realise. The majority of stocks to which this rule applies are standing well above the minima, but for Central Electricity 3½ per cent. 1963-93 and 3¼ per cent. of 1974-94 there are no buyers at the fixed prices of 90 and 84 respectively. Purchasers may come into the market at any moment, it is needful to add; if they did, the prices of the stocks would be restored to their accustomed dealing figures in the Stock Exchange Official List. It can readily be understood that the inability to sell stock, say for account of executors, gives rise every now and then to inconvenience. This is inevitable when the country is at war and when, accordingly, personal requirements have to give place to national necessity.

ELECTRICAL COMPANIES' SHARES

Prices, Dividends and Yields

Company	1940 High-est	1940 Low-est	Dividend Pre-vious	Dividend Last	Middle Price Aug. 27	Rise or Fall	Yield p.c. £ s. d.
Home Electricity Companies							
Bournemouth and Poole	63/6	41/6	15	15	41/3	...	—
British Power and Light	30/–	21/–	7	7	22/6	+1/–	6 4 4
City of London	28/–	20/–	7½	7½	22/–	+6d.	6 16 4
Clyde Valley	38/6	25/–	8	8	31/3	+⅛	5 2 5
County of London	43/3	22/–	10½	10½	30/–	+⅛	7 0 0
Edmundson's:							
7% Pref.	31/6	26/3	7	7	28/3	...	4 19 1
Ord.	27/6	18/6	9	6	23/–	+1/6	5 4 4
Elec. Dis. Yorkshire	40/3	32/6	9	9	32/6	...	5 10 9
Elec. Fin. and Securities	41/3	38/6	12½	12½	38/9	...	6 9 0
Elec. Supply Corporation	46/3	37/–	12	11½	37/6	...	6 2 8
Isle of Thanet	16/–	5/6	4	4	6/–	...	13 6 8
Lancs Light and Power	33/–	25/–	7½	7½	26/3	...	5 14 3
Llanelly Elec.	21/–	17/–	5½	5½	17/6	−6d.	6 5 9
Lond. Assoc. Electric	21/–	12/6	7	5½	15/–	...	—
London Electric	37/6	19/–	8	7	20/–	...	7 0 0
London Power Deb. Red.	105½	101	5	5	101½	...	4 18 6
Metropolitan	41/6	23/6	12	10	28/9	+6d.	6 19 2
Midland Counties	39/–	24/3	8	8	27/6	...	5 16 5
Mid. Elec. Power	40/–	29/6	9	9	31/3	...	5 12 2
Newcastle Elec.	29/9	24/6	7	7	24/6	...	5 14 3
North Eastern Electric:							
Ordinary	31/6	17/6	7	7	22/6	...	6 11 9
7% Pref.	32/6	26/6	7	7	27/6	...	5 1 10
Northampton	48/–	39/–	10	10	38/9	...	5 3 3
Notting Hill 6% Pref. (£10)	10¾	9	6	6	9	...	—
Northmet Power:							
Ordinary	42/3	23/–	10	10	28/9	+⅛	—
6% Pref.	29/–	23/–	6	6	26/–	...	4 12 4
Richmond Elec.	24/6	18/–	7	6	20/–	...	—
Scottish Power	38/–	24/–	8	8	28/9	+6d.	5 11 4
Southern Areas	21/3	13/9	5	5	13/9	...	7 5 6
South London	23/3	20/–	7	7	20/–	...	7 0 0
West Devon	20/–	18/6	5	5	20/–	...	5 0 0
West Glos.	21/3	15/–	2½	4½	16/3	...	5 13 10
Yorkshire Elec.	40/–	24/6	8	8	28/9	...	5 11 5
Overseas Electricity Companies							
Atlas Elec.	4/–	1/3	Nil	Nil	1/9	...	—
Calcutta Elec.	37/–	22/6	10*	8*	28/–	+6d.	5 14 6
Cawnpore Elec.	30/–	24/–	10	10	25/–	...	8 0 0
East African Power	25/6	20/–	7	7	20/–	...	7 0 0
Jerusalem Elec.	24/–	17/9	7	7	18/9	...	7 9 4
Kalgoorlie (10/–)	12/6	9/6	7½	7½	11/–	...	6 16 5
Madras	26/9	25/–	8*	6*	25/–	...	4 16 0
Montreal Power	35½	30	1½	1½	32	...	—
Palestine Elec. "A"	25/–	13/–	5*	Nil	13/9	...	—
Perak Hydro-electric	20/3	13/6	6	2½	13/9	...	3 12 9
Shawinigan Power	27½	19	83cts.	90cts.	20½	...	—
Tokyo Elec. 6%	69	52	6	6	52½	...	11 8 6
Victoria Falls Power	75/9	56/–	15	15	65/–	+⅛	4 12 4
Whitehall Investments Pref.	17/9	8/–	7½	7½	9/6	...	15 16 0
Public Boards							
Central Electricity:							
1950–70	110½	104	5	5	104½	...	4 15 8
1955–75	112½	106	5	5	106½	...	4 14 0
1951–73	107½	102	4½	4½	102½	...	4 7 10
1963–93	96½	90	3½	3½	90	...	3 17 9
London Elec. Trans Gtd.	92	87½	2½	2½	89	...	2 16 2
London & Home Counties							
1955–75	113½	105	4½	4½	105½	...	4 5 4
Lond. Passenger Transport							
A	116	104	4½	4½	107	...	4 4 0
B	116	102½	5	5	104½	...	4 15 8
C	65½	25	1½	1½	28	...	5 7 2
West Midland Joint Elec.							
1948–68	106½	105	5	5	105½	...	4 14 9
Telegraph and Telephone							
American Tel. & Tel.	215	180	9	9	190	...	4 14 9
Anglo-Am. Tel.:							
Pref.	106	85	6	6	87	...	6 18 0
Def.	23½	18	1½	1½	18½	...	8 2 2
Anglo-Portuguese	22/6	10/–	8	8	11/3	...	14 4 6
Cable & Wireless:							
5½% Pref.	99¾	70	4½	5½	86	...	6 8 0
Ord.	65	28½	4	4	48	...	8 5 0
Income	99¾	93	...	...	97	...	4 2 4
Canadian Marconi $1	6/–	4/–	Nil	4cts.	4/3	...	—
Globe Tel. & Tel.:							
Ord.	32/6	21/6	7½*	6*	25/–	...	4 16 0
Pref.	22/9	22/6	6	6	23/9	...	5 1 1
Great Northern Tel. (£10)	20	11	20	20	12½	...	—
Inter. Tel. & Tel.	5½	3	Nil	Nil	3	...	—
Marconi-Marine	30/–	18/3	10	7½	18/9	...	8 0 0
Oriental Telephone Ord.	2¾	48/–	12*	11¼*	2¼	...	4 12 0
Telephone Props.	15/–	11/–	5	6	12/6	...	9 12 0
Telephone Rentals (5/–)	9/6	5/9	10	10	5/9	...	8 14 0
Traction and Transport							
Anglo-Arg. Trams:							
First Pref. (£5)	4/3	1/3	Nil	Nil	2/–	...	—
4% Inc.	11½	2	Nil	Nil	3½	...	—
British Electric Traction:							
Def. Ord.	830	440	5	45	600	+10	7 10 0
Pref. Ord.	169	134	8	8	140	...	5 14 3
Bristol Trams	48/6	34/6	10	8*	35/–	...	—
Brazil Traction	12¾	5½	$1	50c.	5½	...	—
Calcutta Trams	24/–	16/3	8	5½	17/–	...	6 9 4
Cape Elec. Trams	18/6	16/–	5	5	17/–	...	5 17 8
Lancs Transport	35/–	27/6	10	10	30/–	...	6 13 4
Mexican Light:							
1st Bonds	33	27	5	5	27½	...	—
Rio 5% Bonds	90	74	5	5	80	...	6 5 9
Southern Rly.:							
5% Prefd.	79	35	5	5	46	...	10 17 4
5% Pref.	104½	60	5	5	77	...	6 9 10
T. Tilling	45/9	31/–	10	10	33/9	+¼	5 18 6
Tilling & B.A.	47/6	43/9	9*	8*	45/–	...	—
West Riding	35/–	26/–	10	10	27/–	...	7 8 2
Equipment and Manufacturing							
Aron Electricity Ord.	17/6	10/–	15	Nil	10/–	...	—
Assoc. Elec.:							
Ord.	43/3	27/–	10	10	35/–	...	5 14 4
Pref.	35/3	32/3	8	8	33/9	...	4 14 10
Automatic Telephone & El.	47/3	32/–	12½	12½	35/–	...	7 2 10
Babcock & Wilcox	50/–	28/6	10	11	32/6	...	6 15 4
British Aluminium Ord.	56/–	33/–	12½	12½	34/6	...	6 5 6
British Insulated Ord.	92/6	67/–	20	20	72/6	...	5 10 4
British Thermostat (5/–)	14/9	6/6	18½	18½	7/6	...	12 6 8
British Vacuum Cleaner(5/-)	12/6	6/3	40	12½	6/3	...	10 0 0
Brush Ord.	4/6	1/9	Nil	Nil	2/6	...	—
Callender's	69/–	46/–	15	15	50/–	...	6 0 0
Chloride Elec. Storage	72/6	55/–	15	15	2⅞	...	5 4 4
Consolidated Signal	72/6	59/–	36½	17	60/–	...	5 13 4
Crabtree (10/–)	24/9	17/6	17½	17½	20/–	...	8 15 0
Crompton Parkinson:							
Ord. (5/–)	20/–	12/6	30	20	15/–	...	6 13 4
E. K. Cole (5/–)	5/–	2/6	10	Nil	3/–	...	—
Elec. & Musical Industries (10/–)	10/3	4/3	5	Nil	6/6	+3d.	—
Electric Construction	36/3	30/–	13½	10	30/–	...	6 13 4
Enfield Cable Ord.	56/–	40/6	25	16½	45/–	...	7 13 0
Electrical Switchgear (10/–)	22/6	20/–	16	10	20/–	...	5 0 0
English Electric	33/9	16/6	10	10	25/–	+½	8 0 0
Ensign Lamps (5/–)	15/3	13/9	25	25	13/9	...	9 1 10
Ericsson Tel. (5/–)	39/3	25/–	25*	25*	25/–	...	5 0 0
Ever Ready (5/–)	28/3	17/3	30	40	24/–	+6d.	8 6 8
Falk Stadelmann	18/3	12/6	6	7	13/9	...	8 14 6
Ferranti Pref.	25/–	23/–	7	7	23/3	−1/9	6 0 5
G.E.C.:							
Pref.	32/6	27/–	6½	6½	28/9	...	4 10 6
Ord.	83/3	56/–	20	20	70/–	+¼	5 14 3
Greenwood & Batley	25/6	20/–	15	13	20/–	...	13 0 0
Hall Telephone (10/–)	18/6	8/9	15	10	8/9	...	11 8 6
Henley's (5/–)	21/6	13/6	20	20	16/3	...	6 3 1
4½% Pref.	21/3	20/6	4½	4½	21/3	...	4 4 8
Hopkinsons	46/9	33/6	12½	15	35/–	...	8 11 6
India-Rubber Pref.	21/–	20/–	5½	5½	20/9	...	5 6 0
Intl. Combustion	121/3	70/–	32½	32½	4	...	8 2 6
J. Lucas	60/6	40/–	15	15	50/–	+½	6 0 0
Johnson & Phillips	50/9	33/–	12½	15	40/–	+½	7 10 0
Lancashire Dynamo	59/9	47/6	25	20	47/6	...	8 8 5
Laurence Scott (5/–)	11/–	6/–	15	15	8/–	...	9 7 6
London Elec. Wire	25/6	20/–	7½	7½	22/6	...	6 13 4
Mather & Platt	46/6	30/–	13½	10	32/6	...	6 3 1
Metropolitan Elec. Cable Pf.	22/–	21/3	5½	5½	21/3	...	5 3 6
Murex	86/9	52/6	20	20	70/–	...	5 14 4
Pye Deferred (5/–)	9/–	6/9	25	25	8/9	+9d.	14 5 8
Revo (10/–)	20/9	12/6	17½	5	12/6	...	4 0 0
Reyrolle	60/6	41/–	12½	12½	42/6	...	5 17 8
Siemens Ord.	23/9	16/3	7½	7½	17/6	...	8 11 6
Strand Elec. (5/–)	2/3	9d.	10	4	1/3	...	10 0 0
S. Smith (1/–)	8/–	3/6	37½	50	5/–	+⅛	10 0 0
Switchgear & Cowans (5/–)	11/9	5/6	20	10	6/3	...	8 0 0
Telegraph Condenser (10/–)	8/9	6/3	5	—	8/9	...	—
Telegraph Construction	42/6	29/–	10	10	30/0	...	6 13 4
Telephone Mfg. (5/–)	9/–	5/–	9	9	5/6	...	8 3 8
Tube Investments	96/9	61/3	23¾	23¾	80/–	+¼	5 18 9
Vactric (5/–)	3/6	2/–	4	Nil	2/3	...	—
Vickers (10/–)	22/–	9/6	10	10	13/–	...	7 13 10
Ward & Goldstone (5/–)	19/9	12/6	20	20	12/6	...	8 0 0
Westinghouse Brake	46/–	32/9	17½	10	32/6	...	6 3 1
Walsall Conduits (4/–)	26/6	17/6	55	55	23/9	...	9 5 0
West, Allen (5/–)	7/–	3/–	10	7½	3/9	...	10 0 0

* Dividends are paid free of Income Tax.

CONTRACT INFORMATION

Particulars of work for which tenders are invited, contracts placed, and building schemes promising work for electrical contractors and traders

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses. Further details of items marked with an asterisk can be obtained from the Department of Overseas Trade (Inquiry Room), Great George Street, London, S.W.1.

Argentina.—BUENOS AIRES.—September 16th. Argentine National Sanitation Works Department. Eleven electrically driven centrifugal deep-well pumping sets. (T. 21205-40)*

Australia. — SYDNEY. — October 24th. County Council. One 50,000-kW steam turbo-alternator set for the Bunnerong power station. (T. 16057/40.)*

MELBOURNE.—September 10th. Deputy Director, Posts and Telegraphs. Underground cable. (T. 21127/40.)*

September 3rd. Transmitters. September 5th. Condensers and receivers. (T. 21223/40.)*

State Electricity Commission. October 15th. 4,000 ft. of cable for use on a three-phase 6.6-kV system. (T. 21227/40.)*

September 3rd. Switchgear. (T. 21385/40.)*

Bradford. — September 5th. Corporation. Three-phase static transformers (contract D.2). Tender form from Mr. W. Dundas, deputy city electrical engineer and manager, 27, Bolton Road. (Deposit £1 1s.) Tenders to N. L. Fleming, town clerk, Town Hall.

Egypt.—CAIRO.—September 4th. Ministry of Education. Weaving machines with electric motors for trade school (voltage 220 DC). (T. 21229/40.)*

Manchester.—September 14th. Waterworks Committee. Three electrically driven centrifugal pumps, with motor starters, pipes, valves, &c., for Denton Reservoirs. (August 23rd.)

September 16th. Electricity Committee. Supply and erection over a period of two years of 3-phase, 6,600-V substation switchgear. (See this issue.) September 19th. Three water-tube boilers and auxiliaries, &c., at Stuart Street station. (See this issue.)

New Zealand. — WELLINGTON.—October 8th. Public Works Department. 20,000-kVA synchronous condenser with control and protective equipment. (T. 21199/40.)* Four 2,500-kVA transformers or alternatively eight 1,677-kVA transformers. (T. 21197/40.)*

October 15th.—66-kV outdoor switchgear and steelwork for Winton substation. (T. 21206/40.)*

South Africa.—PRETORIA.—Union Tender and Supplies Board. October 3rd. Distribution boards, switches and fuses, and switch boxes. (T. 21239/40.)*

September 19th. Seven electric passenger lifts, two electric goods lifts and three electric service lifts at the new G.P.O. Building, Cape Town. (T. 21012/40.)*

October 10th. Public Works Department. Laundry machinery, including electric motors, for Krugersdorp Mental Hospital. (T. 21352/40.)*

October 10th. One 15 kW Diesel engine lighting plant for the Agricultural College, Glen, O.F.S. (T. 21351/40.)*

CAPE TOWN.—September 5th. Electricity Department. Thirty-two 6-ft., eight 4-ft. and 56 2-ft. double-tier heaters for the wards of the Infectious Diseases Hospital. (T. 20785/40.)*

October 8th. Electricity Supply Commission. Two 2,000-kVA transformers. (T. 21222/40.)*

JOHANNESBURG.—September 14th. City Council. Joint box compound. (T.Y. 21428/40.)*

September 30th. S.A.R. and Harbours Administration. Electric lamps for the year ending December 31st, 1941. (T.Y. 21434/40.)*

October 24th. Public Works Department. L.v. underground cable. (T.Y. 21433/40.)*

Warrington.—September 2nd. Electricity Department. Cables, twelve months' supply of earthenware conduits, cable protection slabs, tiles and covers. (August 23rd.)

Orders Placed

Lanarkshire. — County Council. Accepted. Installation of electric lighting in 14 houses.—Neil Thomson.

London.—BATTERSEA.—Electricity Committee. Accepted. Wharf crane (£7,000). Stothert & Pitt. Mobile crane (£1,823).—Priestman Bros.

Stockton-on-Tees.—Town Council. Accepted. Substation transformer.—Brush Electrical Engineering Co.

Worcestershire.—Education Committee. Accepted. Electrical installation, Hill & Cakemore senior school (£452).—Gwilliam Bros. Electrical installation, Pershore junior school (£210).—S.W. & S. Electric Power Co.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Alcester.—Houses (12), Salford Priors, for R.D.C.; surveyor, Beachfield Street, Alcester.

Aspley Heath (WARWICKSHIRE).—Bungalows, Blind Lane; J. Shuter, One Oak, Aspley Heath, Tamworth.

Bakewell. — Communal shelters, for R.D.C.; surveyor, Council Offices.

Banbury. — Garages, Bridge Street depot; E. O. Reid, town clerk, Municipal Buildings, Banbury.

Billingham-on-Tees. — Adaptation of building as mortuary and ambulance garage; U.D.C. surveyor.

Bolsover (DERBYS).—Brick communal shelters on various sites; H. Taylor, architect, Regal Chambers, Chesterfield.

Boston.—Rebuilding Flour Mills for W. & H. Bedford, Ltd.; H. A. Mobbs, architect, 18a, High Street.

Bridgnorth.—Town hall alterations and conveniences, for T.C.; borough engineer, Municipal Offices.

Brixham.—Fire station; J. S. Churchill, architect, 17, Fore Street, Brixham.

Burton-on-Trent. — Further shelters (£53,000); borough engineer.

Bury.—Extensions to Corporation workshops (electric light and heating installations); J. Chadwick, borough engineer, Bank Street.

Cardiganshire.—Ten public shelters at Aberystwyth and shelters at Lampeter, Taifyside, and Tregaron, for C.C.; county architect, County Hall, Aberayron.

Cheshire.—Emergency maternity hospitals, Macclesfield, Bowden & Neston; county architect.

Chester-le-Street (Co. DURHAM).—Blocks of air-raid shelters (£46,000); G. B. Brown, surveyor, Rural District Council Offices, Chester-le-Street.

Coalville.—Boiler house; Cascelloid, Ltd.

Boiler house; Clutsum & Kemp, Ltd.

(*Continued on next page.*)

Financial Section (*Concluded from page* 182)

(Reports and Dividends—continued)

laboratory erected to make them independent of external supplies of hydrogen and nitrogen. This laboratory not only now supplied the company with those elements at a fraction of their previous cost, but also supplied part of Eire's requirements. Other developments were a machine shop to repair and make machinery formerly imported from Germany, and a testing apparatus designed to ensure higher standards than even the best imported lamps. Extensions had been made to the factory which had enabled them to double the output of household and auto mobile lamps. Arrangements had been made for the production and export of many millions of lamp parts for a neighbouring country. Reductions of from 12½ per cent. to 22 per cent. over their whole field of household and high voltage lamps would be made from August 19th.

Sheffield Steel Products, Ltd., reports a trading profit for the year to March 31st of £76,630, an increase of £27,939 as compared with 1938-39. After providing for depreciation, taxation, A.R.P. expenditure, &c., it is proposed to pay an ordinary dividend for the year of 4 per cent. General reserve receives £5,000 and £1,361 is allocated to provide for additional debenture sinking fund. The balance carried forward is £5,922 (against £1,119 brought in). The last distribution on the ordinary stock was for 1920, when 10 per cent. was paid. In March, 1939, the paid-up capital was reduced from £558,262 to £186,087.

Gabriel Wade & English, Ltd, report a trading balance for the year to May 31st, including investment income, of £212,684, as compared with £126,353 for 1938-39, which with interest receivable (£1,591) makes a total of £218,274. Board fees amount to £1,000 and depreciation requires £10,311. E.P.D. absorbs £75,000, income-tax £18,144, and tax reserve £43,000. The ordinary dividend for the year is 6 per cent., plus a bonus of 4 per cent. (unchanged), reserve receives £20,000, and £53,385 is carried forward (against £51,916 brought in).

Thomas De La Rue & Co., Ltd., report a profit on trading for the year ended March 30th of £141,285, as compared with £283,855 for the preceding year, which with income from other sources makes £147,309. After deducting debenture interest, directors' fees and depreciation, there is a balance of £103,446 (£248,355), and it is proposed to pay a final dividend of 9 per cent. (same) and a cash bonus of 6 per cent. (11 per cent.), making 21 per cent. for the year (against 26 per cent.). The balance carried forward is £49,480 (against £18,904 brought in).

The Southern Brazil Electric Co. reports net revenues for 1939 of £10,862, as compared with £8,974 for 1938. Other income amounted to £96,124, as compared with £41,976. This rise is due to an increase of £12,661 in interest from subsidiary companies, the payment of a dividend by a subsidiary company of £40,144, and an increase in miscellaneous other income of £1,343. After providing for interest and other deductions, the balance of revenues, before exchange adjustments, carried forward in reduction of the deficit amounted to £59,153. This compares with a balance of £2,969 reported in 1938.

The Ransome & Marles Bearing Co. reports a net profit for the year to June 30th last of £163,038, an increase of £3,000 as compared with 1938-39. It is proposed to pay a final dividend of 11 per cent., making 20 per cent., less tax, for the year (same).

The South Metropolitan Electric Light & Power Co., Ltd., is maintaining its interim dividend at 3 per cent., less tax.

The Bognor & District Gas and Electricity Co. has announced an interim dividend of 4 per cent. on the "A" stock, 4⅜ per cent. on "B" stock, and 3½ per cent. on new stocks (all unchanged).

Coventry.—Houses, Scott Lane and Stoke Aldermoor; W. Cooper & Sons (Builders), Ltd., West Street, Blackheath, Birmingham.

Croydon.—Addition to kitchen; C. Chart, architect, Union Bank Chambers, Katherine Street, Croydon.

Cumberland.—Communal shelters at Silloth and Kirkbride for the C.C.; county architect, County Offices, Carlisle.

Darlington.—Shelters for F. W. Woolworth & Co., Ltd., and Skerne Works, Ltd.; W. Lyall architect, 19, Victoria Road, Darlington.

Garage, Haughton Road; E. Minors, borough engineer.

Dewsbury.—Shelters, Victoria Central School and Whitley Sanatorium; H. Booth, town clerk, Town Hall.

Eire.—DUBLIN.—Flats for Corporation Housing Committee (£66,132); J. Rooney. Cottages (£118,176); Messrs. Fearson. Cottages (£44,000); G. & T. Crampton.

Reconstruction and alteration of buildings at James's Street, for Board of Assistance; J. E. S. Condon, clerk, Boardroom, 1, James's Street, Dublin.

COUNTY CLARE and COUNTY CARLOW.—Commissioners of Public Works, Dublin, invite tenders up to September 4th for national schools at Brian Boru, Co. Clare, and Glynn, Co. Carlow.

CASTLETOWN-BERE (Co. CORK).—Extensions and alterations to creamery, for Dairy Disposal Co., Ltd.; J. Gallivan, Aburi House, Countess Road, Killarney.

ARKLOW.—Houses (124); P. J. G. Bannon, town clerk, Urban Council Offices, Arklow.

Eynsham.—Church of St. Peter, Abbey Field, for Archdiocese of Birmingham; F. R. Cox, architect, The Blanket Hall, Witney.

Farnborough.—Houses (50), for U.D.C.; Surveyor's Department, Town Hall, Farnborough, Hants.

Gateshead-on-Tyne. — Alterations at works of Wire Ropes, Ltd.; J. M. Rownthwaite, architect, 3, Ellison Place, Newcastle.

Glasgow.—Air-raid shelters for Corporation to accommodate 2,000 people; city engineer.

Reconstruction and extension of premises for Kenneth Macleod & Co., Ltd.; Magnus Duncan, architect, 243, Eglinton Street, Glasgow.

New buildings at Maryhill for Salvation Army; J. C. H. Vint, architect, Queen Victoria Street, London, E.C.4.

Houses (80), Hawthorn Street; W. M'Nab, Housing Department, Trongate, Glasgow.

Hospital schemes; city engineer.

Clinic (£2,100); city engineer.

Medical service centre; city engineer.

Golborne.—Shelters for U.D.C.; A. Clough, surveyor, Newton Road, Lowton, near Warrington.

Great Yarmouth.—Buildings, Buckenham Tofts Hall, for P.A.C.; secretary, Town Hall (Annexe), Great Yarmouth.

Hanley.—Rebuilding abattoir, Bryan Street, for F. W. James & Son; E. T. Watkin, architect, Burslem, Stoke-on-Trent.

Harthill.—Reconstruction and additions for West Benhar Co-operative Society, Salsburgh; Cowie & Miller, architects, Cleland Road, Wishaw.

Hendon.—Records store (£1,800), Town Hall; borough engineer, Town Hall, N.W.4.

Hillington.—Factory; Cefoil, Ltd.

Hyde (CHES).—Domestic and communal air-raid shelters for 48 persons each (electrical work); J. H. Ward, borough surveyor, Town Hall.

Lancashire. — Shelters at Poulton-le-Fylde elementary schools, for E.C.; county architect, County Offices, Preston.

Lanchester.—Fourteen public shelters; R.D.C. surveyor.

Llwchwr.—Shelters at Gorseinon, Pontardulais, and Gowerton, for U.D.C.; engineer, Council Offices, West Street, Gorseinon.

London.—SOUTHGATE. — Stores and offices, High Street and Balaams Lane; C. E. Owen Ward.

WALTHAMSTOW.—Factory alterations, for A. C. Cossor, Highbury Grove. Depot alterations for Express Dairy Co., 15, Tavistock Place, W.C.1.

Lymm (CHES).—Communal and domestic air-raid shelters for U.D.C.; D. Mort, surveyor, Council Offices.

Macclesfield. — Houses at Gawsworth, Withington, Mottram St. Andrew, Chelford, &c., for R.D.C.; J. H. Walters, architect, Moody Chambers, Congleton.

Manchester.—Two-storey building; Carter Hiles & Co.

Works canteens; J. R. Petter, architect, 2, High Street, Sheffield, and W. Johnson & Sons, architects, 27, Oldham Road, Miles Platting.

Morley.—Extensions for canteen, Dean Hurst Mill, Gelderd Road, Gildersome; W. Whitehead & Son.

Morpeth.—Shelters for the T.C.; F. K. Perkins, borough engineer.

Mottram (CHES).—Refreshment house for Miss E. Barnes; H. Robinson, architect, Noel Avenue, Ashton-under-Lyne.

Newcastle-on-Tyne. — Public shelters; Percy Barr, city engineer, Town Hall, Newcastle-on-Tyne, and J. and W. Lowry, builders, Corporation Street, Newcastle.

Orpington.—Buildings adjoining first-aid post, for U.D.C.; surveyor, Bark Hart, Orpington, Kent.

Oxford.—Offices and cloakroom, Witney Grammar School, for C.C.; G. R. Hutton, county architect, 3, Becket Street, Oxford.

Oxfordshire. — Reinstatement of Banbury County School, for C.C.; G. R. Hutton, county architect, 3, Becket Street, Oxford.

Pontardawe.—Shelters scheme (£2,730), for R.D.C.; surveyor, Council Offices.

Pontypridd.—Public shelters (£5,250) and domestic shelters (£4,000), for U.D.C.; Town Clerk's Department, Municipal Buildings.

Portland.—Shelters; U.D.C. surveyor.

Poynton.—Commercial garage, Georges Road; Mr. J. H. Whittall, Street Lane Farm, Adlington.

Skipton.—Pump house, for R.D.C.; A. Rodwell, engineer and surveyor, R.D.C. Council Offices, Skipton.

Smethwick.—Works additions, High Street; F. Gilman (B.S.T.), Ltd., Warehouse, Cross Street; J. C. Nicklin, Ltd.

Staffordshire.—School at Great Barr; G. C. Lowbridge, county architect, County Offices, Stafford.

Stirling.—Air-raid shelter for W. Alexander & Sons, Ltd.; the manager.

Stockton-on-Tees.—Air-raid shelters for R.D.C. Contractors: J. McCreton, Ltd., West Terrace, North Ormesby, Middlesbrough; Proud, Ltd., 195, York Road, West Hartlepool; E. Crow, builder, Stockton-on-Tees; and Tarslad, Ltd., Stockton-on-Tees.

Stockport. — New Dial Stone hotel (£12,000) for Frederick Robinson & Co., Ltd.; A. Guest, resident architect, Unicorn Brewery.

Stokesley.—Air-raid shelters for Rural District Council; surveyor, R.D.C. Offices, Stokesley.

Thorne (YORKS).—Pumping station in connection with a drainage scheme; W. H. Haile, engineer, Derby Road, Nottingham.

Thurrock. — A.R.P. depot, cleansing station, etc., Tilbury, for U.D.C.; G. F. Andrassy, surveyor, Palmer's Avenue, Grays, Essex.

Tiverton.—Dining hall and kitchen at Blundell's School; borough engineer, St. Andrews Street.

Walsall.—Demolition and reconstruction of portion of the Stork Hotel, Leicester Square; Frank Cooper, Walsall.

Warwickshire.—Classrooms at Hillmorton School, Rugby; county architect.

West Riding. — Seven public shelters, between Penistone and Thurlstone, for C.C.; county architect, County Hall, Wakefield.

Whitehaven. — Houses, Hensingham Road; A. Wilson, borough architect, Town Hall.

Yorkshire.—Shelter at Kirkby Fleetham School; county architect, County Hall, Northallerton.

Rotary Retort Annealing Furnace

TO facilitate annealing on a production basis for small work of both ferrous and non-ferrous types a special electric furnace was recently developed by the American Electric Furnace Company, Boston, Mass., and, states the *Electrical World*, is now in effective use abroad in the bright annealing of cartridge shells.

The cast-iron, high heat-resisting, nickel-chromium retort has an internal spiral screw conveyor cast integral with the retort. The loading drum at the charging end of the retort has an internal arrangement for feeding in work while retarding the escape of heat and atmosphere from the retort. The material in process automatically feeds through the retort into a cooling drum at the right, from which it is discharged at slightly above room temperature.

Heating elements are mounted on the side walls and floor of the chamber, the side elements being supported on sillimanite plates grooved to separate the loops. "Alsimag" pencils retain the elements in position and support the floor elements. Two separate zones of heating are provided to ensure uniform temperature distribution and to compensate for the flow of cold work at the charging end.

A discharge chute at the delivery end of the cooling drum is fitted with a cam operated shutter which opens once each turn of the drum to deliver the processed material. The cooling drum is equipped with spray nozzles, from which water washes the drum as it revolves. Retort and drum are driven as a unit by a motor-operated variable-speed drive and a set of reduction gearing.

Each heating zone has separate temperature control equipment. The first zone uses an indicating control potentiometer and the second a recording control potentiometer. An automatic time clock is connected to the control panels to turn heat on and off as required.

Safety devices include gold temperature limit fuses which will melt and open the circuit if the control potentiometers should fail to function and the temperature rises to 1,940 deg. F. The heating capacity of the furnace is 1,200 lb. per hour to 1,500 deg. F.; overall dimensions are 26 ft. 6 in. long by 5 ft. 8 in. wide by 6 ft. high and the electrical rating is 106 kW for 230 V, three-phase service. Surface density of the heating elements is less than 9 W per sq. in. and the speed of rotation varies from ½ to 2 RPM.

Electrical Fatalities

A youth's death while fitting an electric lamp at Bolton Technical College was described at the inquest, on August 23rd, on Alfred Glover, heating fitter, Chisnall Road, Eccleston.

A foreman fitter, Mr. P. Coughlin, said he found that the brass end of the lamp being fixed was burned. There had been a short circuit and Glover had received a shock. He was standing on an iron platform six feet from the floor. He was not aware this was dangerous work, or he would not have sent the youth to fix it.

The Coroner said that in a building of the size of the new Technical College he did not see why there should not be an electrician in constant attendance. Recording a verdict of "Accidental Death," he agreed that Mr. Coughlin would not have given Glover this work if he had had the slightest apprehension that there was any danger.

Air-raid Warden's Death

During a raid in the South-East of England on Monday last Mr. R. F. Hobley, an air-raid warden, received a fatal electric shock when using a stirrup pump to try to put out a fire. An electric cable burned his hands, and he died later in hospital.